The Business Magazine for Makers & Users of Chemicals
Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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MAY, 1940

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The Reader Writes—

Gas Mask Carbon

We have read with great interest the paper on activated carbon in your March issue. Mr. Wrench is to be congratulated for an excellent and clear popular presentation of the rôle of active carbon in modern purification. However, there are at least two statements which should be corrected.

The popular conception that good gas-mask carbon can only be obtained from dense shells and nuts is fallacious. For many years highly active vapor adsorbent carbons made from hardwoods such as birch and oak have been made and used in Europe. It has recently been found out by one of the present belligerents that of all the available gas-mask carbons, a type of agglomerated, manganese-activated carbon was the best in actual canister tests against all known war gases. Curiously, they could purchase none of it, because the country of origin placed an embargo on its exportation and kept it for itself.

Agglomerated or extruded carbons have been in use in this country for several years as vapor adsorbents and catalysts, and are now manufactured here. It is our experience that hard, dense, vapor adsorbent carbon suitable for gas-mask use can be obtained from practically any carbonaceous material, including the type of raw material of which Mr. Wrench speaks. At the Providence meeting of the A.I.Ch.E. last November, it was stated that our military fórces are not dependent on coconut shells for gas-mask carbon, since suitable adsorbent carbon could be obtained from domestic raw materials. Experience seems to be that agglomerated carbon can be produced from wood more economically and with higher yields than coconut shell carbon, due to the fact that all fines can be used, while the undersize material gotten in screening coconut shell carbon generally finds no use.

Another popular misconception is that decolorizing and vapor adsorbent chars are two separate and distinct products and generally not interchangeable in use. The primary reason for not using a vapor adsorbent type carbon for decolorizing is the cost, and the secondary reason is that the raw material has been processed to bring out or develop its vapor adsorbent capacity. Decolorizing carbons are too bulky, soft and friable for use in a gas-mask, and the raw material has been processed to bring out its decolorizing power. The same raw material could be used, almost without exception, for producing vapor adsorbent chars of high efficiency. The Godel-Akermann furnace, in fact, can simultaneously produce vapor adsorbent and decolorizing types of carbon from the same raw material. Further, decolorizing carbons commercially produced in such furnaces to the extent of several thousands of tons annually have been found to have chlorpicrin saturation values running as high as 89.6 as compared with 81.6 for a commercial vapor adsorbent chars of the 60-minute type. Samples withdrawn from such furnaces at various time intervals, when tested for service life, retentivity and decolorizing value, show that all three increase side by side up to a certain limit, and that thereafter the decolorizing value continues to increase while the service life and retentivity values rapidly fall off.

Regarding the origin of "activated" as applied to decolorizing and vapor adsorbent chars, it is curious to note that Kausch's *Die Aktive Kohle* makes reference to work with *Aktive Kohle* by Knecht & Hibbert in 1908 and 1909, Pelet-Jolivet & Sigrist in 1910, and Leiningen in 1916.

E. L. Luaces,
E. L. Luaces & Associates,
Woodhaven, N. Y.

"Right Church But Wrong Pew"

We note that credit for the article "Titanium Pigments" in your April issue is erroneously given to the writer. The article was prepared by Dr. W. W. Plechner, Assistant Director of Research, National Lead Company, Titanium Division, South Amboy, New Jersey, and credit should go to him.

In the heavy caption heading the article, you credit the writer with being General Manager of Titanium Corporation. The writer is Vice President and *General Sales Manager* of the Titanium Pigment Corporation. You also give the writer credit for being Manager of the Titanium Pigment Division of the National Lead Company. The Manager of the Titanium Pigment Division is Mr. C. F. Garesché, and the writer is only Assistant Manager.

We feel that in fairness to all concerned, corrections as indicated should be made in a subsequent issue of your publication.

I. D. Hagar,
General Sales Manager,
Titanium Pigment Corp.,
New York, N. Y.

Calendar of Events

May

May 10-18, Eighth American Scientific Congress, Washington, D. C.

May 13-15, American Institute of Chemical Engineers, 32nd Semi-Annual Meeting, Statler Hotel, Buffalo, N. Y.

May 14-16, Toilet Goods Association, Hotel Biltmore, New York City.

May 15-17, Natural Gasoline Association of America, 19th Annual Convention, Hotel Tulsa, Tulsa, Okla.

May 16, New England Paint & Varnish Production Club, Hotel Vendome, Commonwealth Ave., Boston, Mass.

May 18-25, International Petroleum Exposition and Congress, Tulsa, Okla.

May 19-20, National Paper Box Mfgrs. Ass'n., Twenty Second Annual Convention, Coronado Hotel, St. Louis, Mo.

May 20, 21, 22, Glass Container Assoc., Greenbrier Hotel, White Sulphur Springs, W. Va.

May 21, 22, 23, National Lime Association, Annual Convention, Drake Hotel, Chicago.

May 22-24, Michigan State-Wide Safety Con ference, Lansing, Mich.

May 22-24, American Water Work Association, Illinois Section at Congress Hotel, Chicago.

May 22-24, National Safety Council, Lansing Mich.—Michigan State-Wide Safety Conference.

May 23, International Petroleum Exposition, Safety Conference, Tulsa, Okla.

May 23, 13th Fox River Valley & Lake Shore Safety Conference, Marinette, Wis.

May 23-25, National Ass'n. Chain Drug Stores, White Sulphur Springs, W. Va.

May 24, American Association of Textile Chemists and Colorists, N. Y. Local section Swiss Chalet, Rochelle Park, N. J.

May 24-25, American Society of Brewing Chemists, Park Central Hotel, N. Y. C.

May 27-29, American Leather Chemists Ass'n., The Sagamore, Bolton Landing, Lake George, N. Y.

May 27-31, American Petroleum Institute, 10th Mid-Year Meeting, Blackstone & Texas Hotels, Fort Worth, Tex.

May 30, Chicago Drug and Chemical Association, Noonday Luncheon, Morrison Hotel, Chicago, Ill.

June

June 3, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Building, Chicago.

June 3-6, National Association of Purchasing Agents, Netherlands Plaza Hotel, Cincinnati, O.

June 3-6, Special Libraries Association, 32nd annual conferences, Claypool Hotel, Indianapolis, Ind.

June 6, Indianapolis Paint, Varnish & Lacquer Association, Columbia Club, Indianapolis, Ind.

June 6-7, Manufacturing Chemists Ass'n., Skytop, Pa.

June 6-7, American Water Works Association, New York Section, Ithaca Hotel, Ithaca, N. Y.

June 6-7, Synthetic Organic Chemical Mfgrs. Assn., Skytop, Pa.

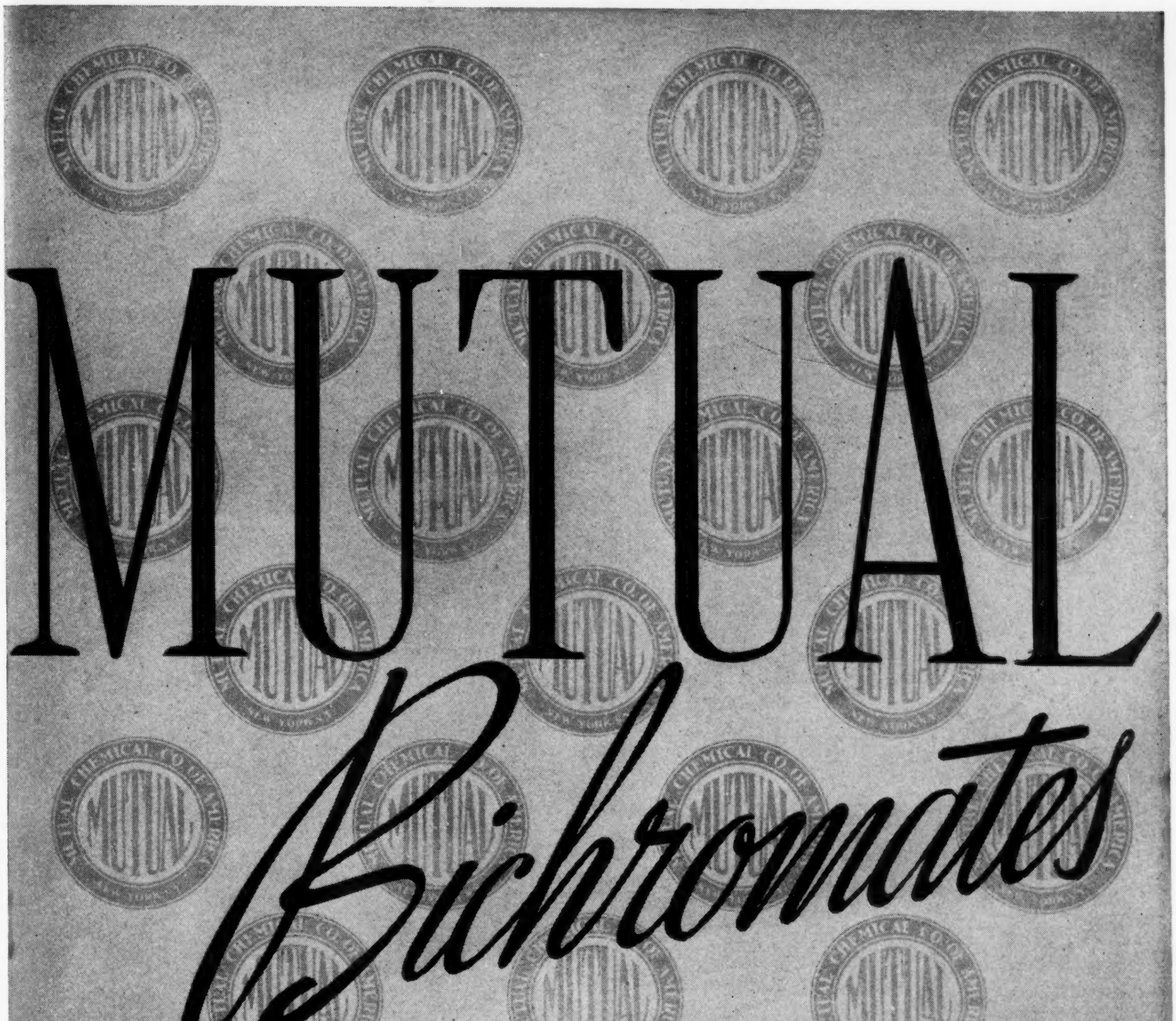
June 7, Baltimore Paint & Varnish Production Club, Baltimore, Md.

June 8, American Chemical Society, New York Section Annual Outing.

June 9-13, American Pharmaceutical Mfgrs. Ass'n., The Broadmoor Hotel, Colorado Springs, Colo.

June 10-11, Texas Cottonseed Crushers' Ass'n., Inc., Annual Convention, San Antonio, Tex., Gunter Hotel.

June 12, New Orleans Paint, Varnish & Lacquer Ass'n., New Orleans Athletic Club, New Orleans, La.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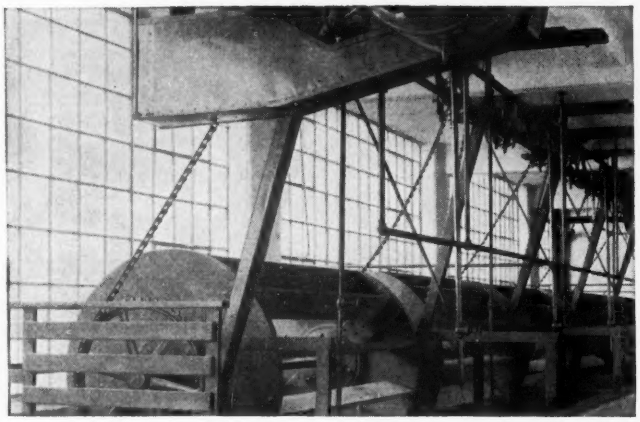
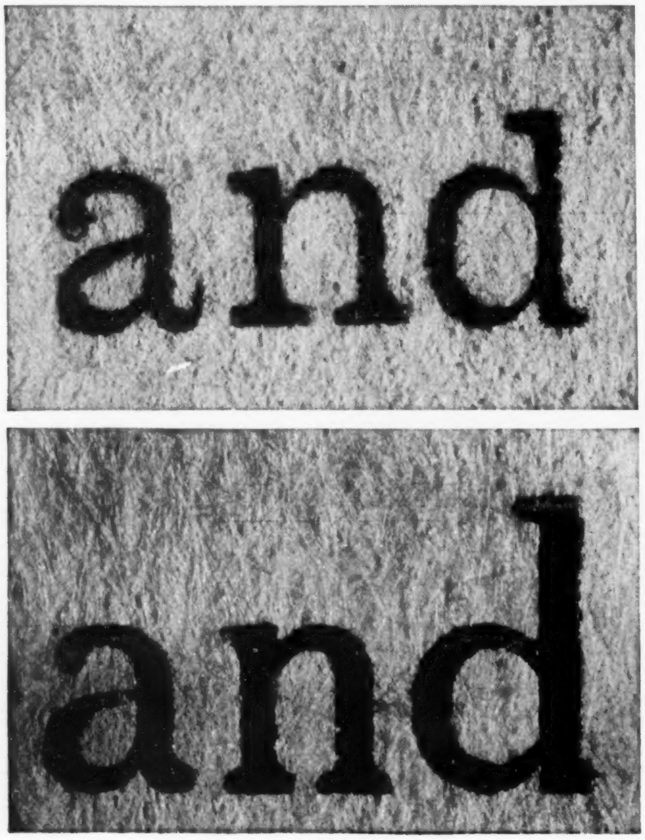


(*Above*) **NEWEST AID IN LEATHER BATING** is Cyanamid's KERALIN† Bate. KERALIN is an entirely new bating preparation—result of a four year search for an enzyme showing extremely strong action on the grain, yet producing leather with a "round feel." Cyanamid will be glad to demonstrate its advantages.

(*Above*) **KILLS WEEDS—FEEDS CROPS.** AERO* Cyanamid Fertilizer destroys weed seeds when first applied, is hydrolyzed by soil catalysts to become a fertilizer for tobacco seeds sown later. Tobacco grown on land treated with Cyanamid the previous fall is seen at left; land at right was not treated.

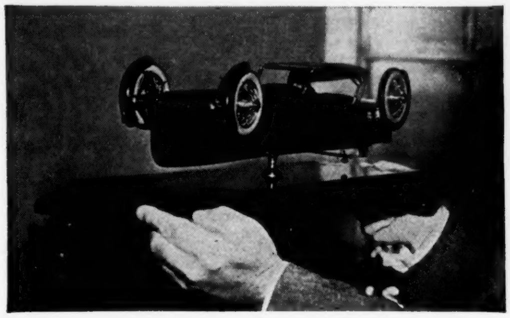
life on the CHEMICAL NEWSFRONT



(*Left*) **INKS THAT "FREEZE"** promise new possibilities in high-speed printing. Solid in their normal state, the inks become fluid under influence of heat, dry instantly by solidifying again as they come in contact with the cool paper. Photomicrographs show the contrast between the fuzzy outline (upper) produced by ordinary inks that dry partly by absorption, and the sharply outlined impressions, free from run or smudge, obtained with the new cold-setting inks.

(*Above*) **VITAMINS FROM GRAIN GRASSES** are a new achievement reported by Dr. W. R. Graham at the American Chemical Society meeting last month. The dried grasses of wheat, oats, barley, and rye have been found to offer potential sources of vitamins in forms that are suitable for pharmaceutical use, for animal feeding, for human consumption.

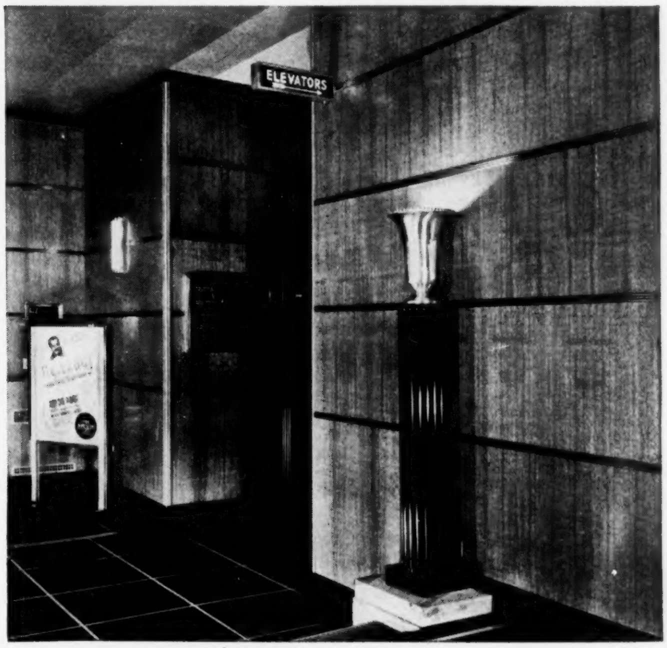
(*Right*) **TEST-TUBE FABRICS** are constantly in the news, as the pioneers of the chemical laboratory open up new economic frontiers, bring new industries and new markets into being. Typical examples of chemical wizardry in creating new fabrics from an amazing variety of raw materials are illustrated in this novel parade of fashions. Costumes shown use raw materials that include such diversified substances as safety glass; casein derived from milk; a vinegary solution; fiber glass; coke; and salt.



(*Above*) **SEA-GOING AUTOS,** now in the model stage, may soon be a reality. Such developments are constantly posing new problems for manufacturers of surface coatings. Latest aid in solving these problems is Cyanamid's revolutionary MELAMINE RESINS —ideal for formulating coatings of high durability.

(*Above*) **FAR-FROM-COMMON CLAY** is "Alsifilm," developed by Dr. Ernst A. Hauser at Massachusetts Institute of Technology —yet clay, in the form of bentonite, is its starting point. Dr. Hauser grinds the bentonite very fine, adds water, skims off the top layer. Resulting mass can be converted into a film that is practically indestructible, resists fire, alkalis, acids.

(*Below*) **NEW DECORATIVE POSSIBILITIES** are opened up by another application of BEETLE‡ MELAMINE RESINS for laminating purposes. Typical instance is this interior of "Realwood"—BEETLE MELAMINE laminated wood paneling of Formica Insulation Company. BEETLE MELAMINE laminated can be produced in a complete range of light-fast colors—displays high resistance to abrasion, hot and cold water, fats, solvents, dilute acids and alkalis.



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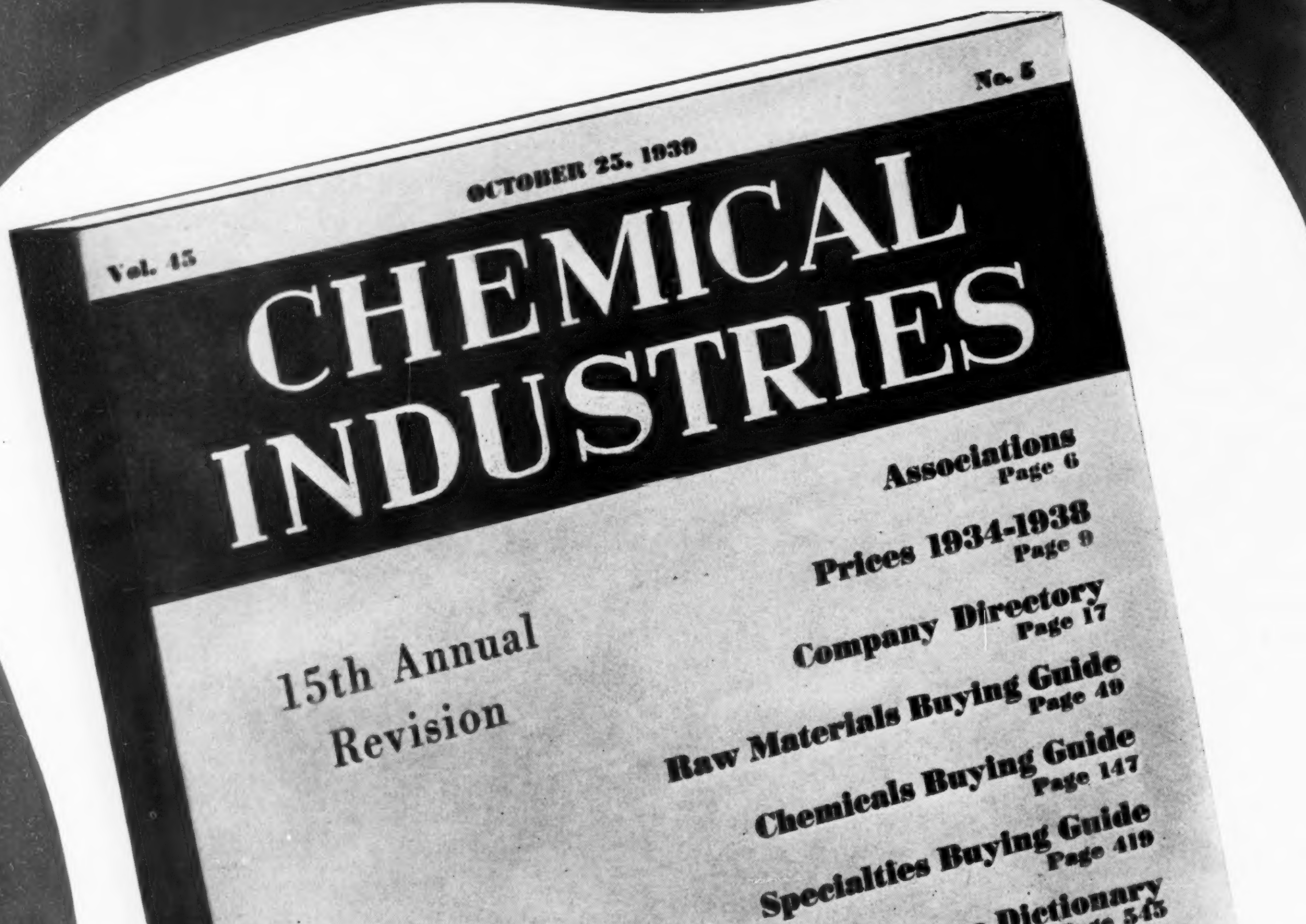

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The Chemical Business Magazine
Established 1914

The Flight of Industry

THE chemical industry is third in the list of nine key industries which have headed a vast industrial exodus from New York State, according to a recent survey made by the *New York Times.* Another thoroughly competent authority reports that at least fifteen chemical plants or warehouses have moved from the Empire State during the last year. Assuming that fifteen represents a yearly average, then no less than seventy-five chemical concerns have vanished from the industrial life of New York State since the wholesale egress began in 1935.

Most of these migrating concerns have relocated in New Jersey and Connecticut. The latter state has no income tax, sales tax or dividend tax. In New Jersey there is no state income tax, corporate or personal. Both states in 1939 were within a few figures of their industrial peaks of 1929. In comparison, New York's lag is alarmingly significant. This might appear to be a problem peculiar to New York State and of little direct interest to executives of concerns located elsewhere. But is it?

Everybody appreciates the economic waste involved when because of excessive taxation or highly undesirable labor conditions an industrial concern finds it necessary to move; that is, everybody but a large body of our professional politicians. Fundamentally, of course, the migration of industry from one state to another is but a temporary palliative and expedient. Experience has shown that politicians will not only spend all of the new revenues that such a migration brings into state coffers, but will seek to pyramid new taxes until eventually industry loses the advantages derived from the migration.

A detailed study of the various retaliatory measures and trade barriers which have either already been adopted or are proposed in many of our states will utterly amaze executives who have not really investigated the situation. We are rapidly erecting artificial barriers through one subterfuge or another to the point where, instead of one country, we will for trade purposes have forty-eight. At a truly alarming rate we are emulating the bad example of Europe and turning our backs deliberately upon one of the fundamental reasons which influenced the thirteen original colonies to unite in a close bond.

Perhaps the signal victory won by the taxpayers of New York State in forcing the adoption of a budget which for the first time since 1933 calls for neither new nor additional taxes and also breaks the curve of state spending which, zooming upward year after year for nearly a decade, has driven thousands of industries from the state to escape steadily mounting taxes, will have a salutary effect in other states as well.

Even New York politicians now appear aroused from their lethargy. Mayor LaGuardia has already organized a special Commission to survey the situation. Governor Lehman has approved a $25,000 appropriation under which the Ives committee will study the problem caused by the flight of industry from the State. This committee, studying labor relations, has completed its work and is to continue with the exodus question, which it raised in its own report.

Editorial

Size Is a Factor Without depreciating the advances made in the last few years in electrical and mechanical fields, the great industrial strides of the last decade have been conspicuously in the realm of chemistry. Small wonder then that the semi-annual meetings of the American Chemical Society are attracting larger and larger attendances. The recent Cincinnati gathering brought out nearly 3,500 of the nation's chemists eager to hear nearly 450 papers and addresses in seventeen major fields delivered at fifty-six sessions.

Americans are traditionally "joiners" and highly convention-minded and our chemists are no exception, despite the popular belief that a chemist is a rather unsociable individual, an introvert who "wants to be alone." More and more progressive directors of research, chief chemists, professors, instructors, even advanced students and others are discovering the value of meeting informally in the lobbies to exchange information of mutual interest.

The meetings have become so well attended that, like the three-ring circus, the individual finds it rather difficult to see all and hear all. For those who are only directly interested in one narrow phase of the industry the problem is a comparatively simple one, but today the various divisions of the chemical field are so deeply interrelated that such individuals are greatly in the minority. For those whose interests are broad and who necessarily are vitally concerned with many ramifications the choice of what papers to hear and what trips to attend presents a serious problem. One need only to thumb through the Cincinnati program to realize the wide scope of research activities now being reported regularly at the semi-annual meetings of the Society. Apple milk, powdered grass, paints to reflect ultraviolet rays, vitamins, rayon cord tires, a new industrial bleaching agent, a new germicide, grapefruit-seed oil, oil from seed of the Kentucky Coffee-Bean Tree, new derivatives of sulfanilamide, new products developed from industrial and agricultural wastes, are just a very few of the items that were reported on by the nation's research workers, but the examples cited are sufficient to indicate the wide diversity of interests. A comparison of the Cincinnati program of last month with the program of the meeting held in that city ten years ago indicates quite clearly how chemical research has penetrated into the life of the nation.

The present size of the meetings and the likelihood that they will increase in number at an accelerated pace over the next few years poses some practical questions. Relatively few cities possess adequate facilities to handle with comfort the numbers even now attending. Considerable informal discussion was in evidence at Cincinnati on the subject and many suggestions were put forward but all of them, including the one that a general meeting be held in the fall and that the present spring meeting be changed to divisional meetings scattered throughout the country, present a number of serious disadvantages.

Accent On Sales It doesn't require the memory of an elephant to recall the time when marketing of his products played a rather minor part in the problems confronting the chemical manufacturer. Before the first World War and in fact, during the early twenties many large producers turned the output of their plants over to an independent sales agency for distribution. Manufacturers were manufacturers in those days, literally and solely.

But marketing progress was long during the short time that has elapsed. Salesmen representing manufacturers began calling on consumers. Their reports often carried the problems of customers into the laboratory for solution as a sales service. This service has grown to a point where many manufacturers now have service laboratories continually experimenting with problems entirely in the interests of customers.

Nor has the market research side been neglected in recent years. Special departments have been created to explore "new use" potentialities of regular-line products; others to evaluate future markets with a view to establishing research trends; still others to nurse along new products and see that missionary sales effort necessary to launch them successfully in the company line is not neglected.

Mr. Logan Grupelli, Market Development Manager of progressive National Oil Products Company, eyed this situation and decided that these services could be improved upon, if all of the data gathered by sales and market research departments were concentrated in one place. Acting on his belief he organized the sales development department, through which all new products of his company pass on their way from laboratory to market.

We are fortunate to begin in this issue a series of articles by Mr. Grupelli, in which he will discuss in detail organization and methods of market development. It is a practical series full of modern ideas that have proved successful in determining uses for new products and launching them on the market.

New Equipment Trend We find among the papers to be presented this month at the Buffalo meeting of the American Institute of Chemical Engineers one by T. O. Wentworth of Vulcan Copper and Dr. D. F. Othmer of Brooklyn "Poly" on the subject "An Economical Method for the Manufacture of Absolute Alcohol."

This paper is indicative of a significant trend on the part of certain equipment makers to widen very materially the scope of their research to the point where they are developing complete processes and are marketing these as such to chemical producers.

Quotation

It would take many pages to illustrate examples of new products and new plants resulting from the advance in chemical science. It has resulted in establishing new industries, and it is difficult to see how anyone can associate scientific advance with unemployment. The simple act of comparing a recent commercial catalog with one say ten years ago would speak for itself.—*The Indicator.*

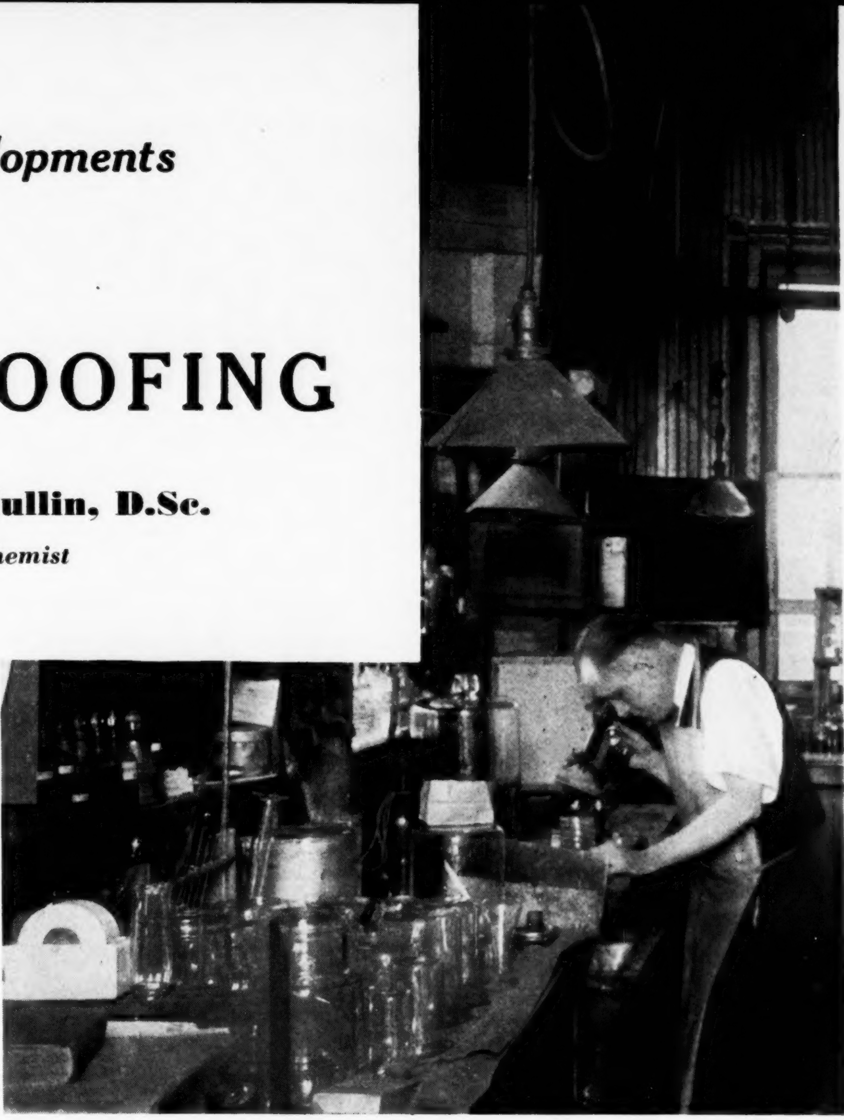
Recent Developments

in

WATERPROOFING

By Charles E. Mullin, D.Sc.

Consulting Chemist



CHEMICAL research has revolutionized many industries but, as yet, research within the textile industry itself has not, in general, greatly altered or changed the chemical or wet-processing operations of the textile industry. In the past decade there have been many new developments in the wet-processing of textiles, but most of these have resulted from the development of new chemicals, almost all of which are the effect of research on the part of chemical manufacturers. The waterproofing of textiles and similar materials is not an exception to the above general statement. All of which means that the development of new waterproofing products and processes for textiles and related products, such as paper, leather, cellophane and related products, even including wood, stone, cement, etc., is a subject of considerable interest to chemical manufacturers.

History and Trends

The idea of waterproof or water repellent fabrics, garments, etc., is certainly not new. John Jasper Wolfen applied for an English patent in 1627 covering "A Newe Invention for the making and preparing of certain Stuffe and Skynes to hold out wett and rayne." The use in parts of South America of rubber-treated materials to "hold out wett and rayne" certainly antedated the discovery of America in 1492.

The author has a file of more than a thousand patents covering various proposed products for, and methods of, rendering textile and related materials waterproof, -repellent or -resistant. Within the last decade or so, the number of these processes and patents has increased tremendously and, at the present time, more waterproofing patents are being granted than at any time in the past.

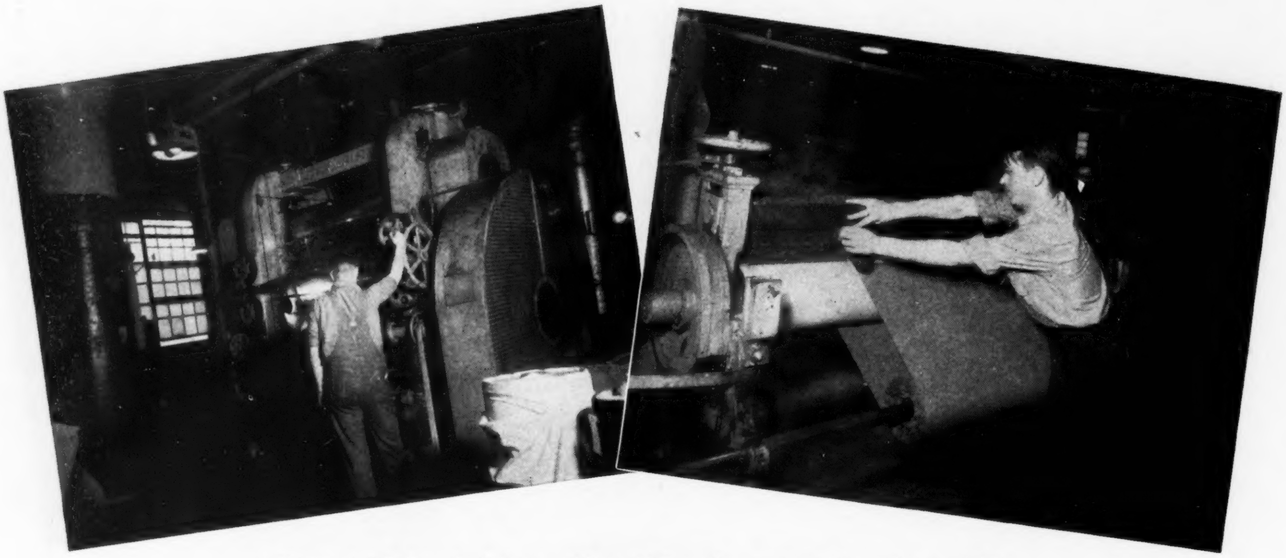
Until very recently, many of the new patents covered physical developments, rather than chemical, and were the natural outgrowth of the many new emulsifying and dispersing agents which became available during this period, a better understanding of the preparation and stabilization of emulsions, in which pH control played an important part, the improved mechanical equipment available for emulsification, and the accumulated experience with the older and better known emulsifiers and stabilizers. These improvements resulted in the now well-known and widely used "one-bath" waterproofing processes which have largely displaced the older two or more bath processes so long in use on textiles, etc.

Although this paper is written from the viewpoint of waterproofing textiles or fibers in various forms, the same theory, practice, products and processes in many cases apply to the waterproofing of other materials, such as paper, leather, and even to wood, stone, etc. The words waterproof and waterproofing are used in the general sense, and are intended to include the less common meanings, water-repellent, water-resistant, shower-proof, etc.

More recently, within the past two or three years, the trend of development has turned towards real chemical processes, rather than along physical lines, wherein the textile fibers themselves actually react with certain reagents to form new fiber (cellulose or protein) compounds, usually esters or ethers, which are more or less hydrophobic. This chemical development is so important at present that these new chemical processes will be covered in a separate paper.

Waterproofing processes may be grouped under about three general headings but, in some cases, the classification of the process will vary with the details of the method of application and the material to which it is applied. Probably all of the following materials and processes are in some use at present for certain types of work although some that were in wide use twenty or thirty years ago, find only a very limited use today.

1. Impregnation
   - (a) Two-bath processes
     - Oils, fats, waxes and soaps
     - Soluble salts of the metals and alkaline earths
     - Metallic soaps, particularly those of aluminum, zinc, calcium, etc.
     - Metallic proteinates
     - Metallic alginates
     - Metallic pectates
     - Mixtures of the above, with or without additions



Shown at left is calendering machine which applies waterproof coating to fabrics in U. S. Rubber Company plant. At right is spreader which applies a thin coating of rubber before calendering process.

(b) One-bath processes
  - Emulsions of the above materials
  - Solvent solutions of most of the above
  - Rubber latex
  - Synthetic and other resin emulsions or solutions, or solutions of resin components
  - Certain easily decomposed aluminum and other salts (formate, acetate)
  - Tar, asphalt, still residues and other bituminous products

2. Coating
  - Painted fabrics
    - Linseed and other oils with pigments
  - "Oiled" silk
    - Tung and other oils or varnishes, with natural or synthetic resins, gums, cellulose esters, etc.
  - Rubberized fabrics
    - Rubber mixtures with pigments, etc.
3. Chemical reactions
  - Esterification and etherification
    - Cellulose esters and ethers (cellulose acetate, and mixed esters)
    - Velan and Zelan

The results obtained by any one of the above processes vary greatly with the exact composition of the waterproofing agent or mixture used, the method of application, the physical and chemical characteristics of the material being treated, etc. For example, rubberizing processes have been widely used on cotton fabrics, generally of fairly light weight, but are much less common on wool, silk or rayon. Such processes are seldom used on paper or leather. The new rubber latex process appears to be more successful on wool materials than on cotton or rayon. The "oiled silk" processes were originally used only on silk, but modified formulas, sometimes resembling paints, have been developed for cotton fabrics, etc. Similar processes have been used on paper and leather. Again, the construction, weave, etc., of the fabric considerably alters the results obtained. In many cases, processes that are suitable for cotton and/or rayon can be used on paper, cellulose wrapping materials, such as cellophane, etc., whereas other textile processes are not applicable to either paper or leather, and *vice versa.*

Many waterproofing materials can be applied by more than one process, under another classification. Most of the modern formulas for impregnation processes contain a variety of materials. Naturally, the results obtained, as regards both waterproofing as well as other physical properties, such as flexibility, porosity, etc., vary widely with differences in the physical and chemical characteristics of both the material treated (yarns, fabrics, paper, leather, cellulose wraps, etc.), the treating materials applied, and the method of application used. For example, both animal, vegetable and petroleum oils, fats and waxes can be applied by a variety of methods and in an even greater variety of combinations or blends. In fact some one or more members of this wide general group is present in more of the impregnation and coating formulas, in one form or another, than any other one group of components.

Generally the formula will contain a blend of more than one component of the oil, fat and wax group, with or without other materials, in order to give the modified physical properties desired. For example, a solid warm or cold oil, fat, wax mixture can be applied to the surface of the fabric, paper, leather, etc., by rubber. When cold and hard, this usually gives only a thin, irregular and discontinuous surface coating which serves to increase the luster and water resistance of the treated material, but the exact results obtained vary widely with the temperature of application, composition, etc., as well as any heat treatment given after the mixture is applied. Such after-heating, often with calendering, of the waxed material (fabric, paper, leather, cellulose wrap) often gives a more even surface and fiber coating, usually with less closing of the pores of the material and less wax on the surface. Fabrics treated in this way are generally more water- or snow-resistant than waterproofed. Wax blends, both as solids and as emulsions, have been used on many types of fabrics and wool and fur hats entirely for their lustering effects.

If the material is impregnated or soaked with the hot and melted mixture of oils, fats and/or waxes, still another effect is obtained. A solvent solution of the same material gives quite a different effect and an aqueous emulsion of the above materials gives still another effect. Obviously, the surface application of drying oils, such as linseed or tung oil, with or without pigments, resins, gums, etc., will result in either painted or "oiled" materials and we find such processes used on both textiles and paper for both decorative and proofing effects. When certain soluble salts of the metals or alkaline earths, such as aluminum, zinc, calcium, etc., are used in conjunction with the oils, fats and waxes, we have metallic soaps present to modify the results.

"Two-Bath" Processes

In the old two-bath processes, the fabric is usually impregnated with a strong soap solution, which often carries additional emulsified fat, wax, or other material. The waxes are often preferred for this purpose on account of their generally greater resistance to rancidity. Sodium oleate soap is most widely used as the impregnating material, but mixed soaps have been used. The water-soluble soap in the fabric is then decomposed, in the second bath, by a solution of a soluble metallic or alkaline earth salt. Aluminum acetate and sulfate were formerly almost always used in the second bath but, more recently, water-soluble aluminum formate

has been used, especially on textiles. Other salts, such as the soluble salts of zinc, calcium (chlorides) and those of other metals, especially those giving "white" insoluble soaps, have also been used, mostly for special purposes.

A recent British Patent, No. 508-701*, which may cover a new idea, uses the effect of chlorine on fatty substances, followed by treatment with calcium or magnesium compounds in very dilute solution. The well dried textile material is treated with a fatty compound, such as a sodium oleate solution, so as to leave approximately one-tenth of one per cent. of fat in the goods. After drying, the soaped goods are exposed to the action of dry chlorine gas, either alone or mixed with air, soaped again, centrifuged, and finally rinsed in hard water containing ten to thirty parts per hundred thousand of calcium and magnesium compounds.

In the above processes the insoluble metallic soaps are formed in the fabric, etc., itself by double decomposition, but the metallic soaps are also applied both as solvent solutions and as emulsions. At the present time these emulsions are finding a wide use in the so-called "one-bath" processes. At one time, various modifications of the two-bath process were almost exclusively used in the textile, leather and paper industries for almost all of the impregnation type of waterproofing but, more recently, these have been largely replaced by the many "one-bath" products (and processes) now on the market. The newer chemical processes are, for certain work, now displacing the one-bath processes to some extent.

"One-Bath" Processes

Some years ago it was found possible to stabilize aqueous emulsions of mixtures of oils, fats, waxes, metallic soaps, etc., in such a way that these emulsions can be applied to textiles, leather, paper, etc., and the resulting film decomposed in and on the material, usually by drying and heating, to give results very similar, and often superior, to that obtained by the older two-bath process discussed above. These one-bath emulsions now find a wide sale and use throughout the textile and other industries, for example, in the manufacture of the so-called "washable" wall papers, certain leathers, etc. As a general rule, these emulsions require careful preparation and handling, but are quite satisfactory in the plant and as regards results. A few of these emulsions, particularly the wax emulsions, are prepared by means of some of the newer

Actual demonstration of water repellent gown, fabric of which had been treated with Du Pont's "Zelan." While this test was made with black coffee, the treated fabric is resistant to water and liquids of all kinds without impairing the soft feel or porosity of fabric. Gowns made of this material can be dry cleaned without injury to waterproof properties.

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* The patents and examples quoted are used merely to illustrate the processes and materials used. They have purposely been selected at random only, and the inclusion or omission of a patent, or examples from any one patent, means nothing as regards to the value of any one patent, process or product.

dispersing agents, but at least some, especially where the metallic soaps predominate, use the older emulsifying agents and stabilizers but depend upon pH control to assist the desired stability. Some of the best products are prepared in special emulsifying equipment.

As would be expected, many of these products have very similar formulas, but a wider variation in composition exists between certain other products. There has been considerable controversy regarding the patents in this field and some manufacturers are now operating under license. An example from United States Patent No. 2,015,864, will serve to illustrate the preparation and application of some of these one-bath waterproofing emulsions.

Three hundred grams of an emulsion, containing ten per cent. of wax and ten per cent. of a fatty acid, are mixed with three hundred liters of water. Two hundred cubic centimeters of an 8° Be. solution of aluminum formate solution is added to the above, to give a solution suitable for treating ten kilos of rayon material. The bath exhausts after working for ten or fifteen minutes at 60 to 70° F. and the material is dried.

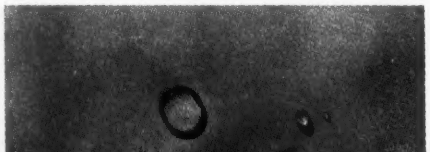
An example in United States Patent No. 2,015,865, proposes to homogenize three hundred parts of paraffin with a solution of one hundred parts of glue and fifty parts of an emulsifying agent, such as a sulfonated oil or the sodium salt of an aromatic sulfonated acid, in five hundred parts of water. One hundred parts of this emulsion are then heated to 40 to 50° C. and fifteen parts of pulverized solid aluminum acetate are stirred into the emulsion. If desired, the aluminum acetate may be added to the glue solution and the paraffin emulsified in this aluminum-glue solution without any added emulsifier.

British Patent No. 509,759, covers the manufacture of a waterproofing agent for brick, stone, etc., wherein an aqueous emulsion of a saponifiable fat or wax, such as beeswax, is prepared by adding an alkaline carbonate and a gelatinous substance, such as fish glue, to a suspension of the wax in water, with or without a preservative. This resembles some of the one-bath formulas formerly used on textiles.

Many tons of emulsified or one-bath waterproofing products are sold every week of the year. They vary widely in both composition and value. Some give much better results than others and the cost per pound or gallon is no indication of the actual waterproofing value of the product. Undoubtedly many of the present products will be improved and the newer chemical processes may take a part of this business but these emulsion products will find a wide sale in the textile and other industries for many years.

Considering the close chemical relationship between the fatty and the amino acids, which are amino substituted fatty acids, it is not entirely unexpected that the metallic and alkaline earth salts of the proteins and their partial decomposition products, the polypeptides and amino acids, should prove of value as waterproofing agent. On account of the insolubility of the fatty acids in aqueous solutions of most soluble metallic (except the alkali metals) or alkaline earth salts, it is quite unexpected to find that casein is soluble in aqueous solutions of aluminum formate at certain concentrations and temperatures, to form a water-soluble product which becomes both insoluble and water-repellent on drying.

United States Patent No. 2,057,675, covers a product of this type. A powdered mixture of seventy parts of casein and thirty parts of aluminum formate are introduced into eight hundred to a thousand parts of water at 75 to 80° C. The mixture is held at this temperature for about twenty minutes, to dissolve the aluminum formate, after which the temperature is reduced to about 55 or 60° C. This temperature is maintained for about an hour, or until the casein is completely dissolved, to give a clear solution. The above concentrated solution or gel is diluted with water at 60° C. to give a solution of one to three per cent. concentration. A very satisfactory waterproofing effect is obtained by applying a two and a half per cent. solution of the above to paper, cotton or wool fabric, for ten to sixty minutes at 60° C., removing the pieces, draining and drying at 60° C.



Globules of water on this fabric demonstrate water repellency of material treated by General Dyestuff Corporation process. Simple procedure consists of impregnation of material in one bath and thorough drying at a moderate temperature.

United States Patent No. 2,057,960, covers a very similar formula except that less water (six hundred parts) is used in preparing the concentrated gel, to which is added a homogeneous mixture of one hundred parts of paraffin, fifteen parts of tetralin and fifteen parts of hexalin. Commercial products prepared under the above patents have been on the market for some time.

British Patent No. 490,215 states that an air-permeable waterproof effect, fast to boiling soap solution, is obtained by dissolving dried egg albumin in cold water to give a twenty per cent. solution. A five per cent. salt solution is added to give an albumin concentration of only one per cent. and this is buffered to pH 4.5 by sodium acetate and acetic acid. Preservatives, such as salicylic acid, thymol, etc., are added. This solution is padded on the goods under conditions such that the material leaving the padder carries sixty to eighty per cent. of its weight of the albumin solution, after which it is treated in an open steamer at 120° C. under atmospheric pressure. The steamed material is treated in a jigger for five minutes with a boiling soap solution at pH 7 to 7.5, after which the goods a washed, dried and finished in the usua manner. Globulin can be used in place of egg albumin.

British Patent No. 496,490 covers waterproofing products prepared from salts of the amphoteric metals, such as sodium aluminate or zincate, and protein. These require dehydration after application and are claimed to be fast to dry-cleaning. British products prepared under the above two patents have been offered on the American market, but are fairly expensive and do not appear to be in common use here.

Numerous other waterproofing processes involving the use of proteins, mostly casein in combination or admixture with other materials, have been patented, but very few of these have as yet come into general use. For example, United States Patent No. 2,036,036 covers the use of casein with rubber latex. British Patent No. 476,869 proposes to use casein with a fatty acid amide to proof paper and fabrics in one operation.

Miscellaneous Materials

The acids from algin and pectin, so-called alginic and pectic acids, resemble the fatty and amino acids in that they form insoluble, hydrophobic products with the metals (except the alkali metals) and alkaline earths. British Patent No. 456,342 proposes the use of aluminum alginate. It is quite possible that as these products

become available at lower prices, they will find use in various waterproofing and certain textile and other finishing processes. Many of these can be applied as emulsions, by the one-bath process, in much the same way as the materials previously discussed.

It is also possible to obtain certain water-or shower-resistant effects on fabrics, rather than a real waterproof effect, by simply impregnating the fabric with an aqueous solution of aluminum acetate or formate, as by padding, drying, and decomposing the salt, so as to deposit aluminum hydroxide or oxide, in the fibers. This also serves to deluster the material. A similar result is obtained by decomposing the aluminum and other salts in the goods by electrolysis and this process was at one time used to some extent. German Patent No. 659,527 proposes to impregnate cotton or wool fabrics with sodium cetyl sulfate followed by a bath of aluminum acetate and drying.

Tars, asphalt, still residues and other bituminous materials have found use for the waterproofing of cotton materials, such as tarpaulins, rain coat fabrics, etc., in the western hemisphere, but have also been used for the cheaper silks, such as coolie raincoats, in the Far East. These are applied as emulsions, solvent solutions, or melted, and are often combined with oils, fats, waxes, etc., which also serve as plasticizers or softeners.

Of course the solvent solutions used in waterproofing are also one-bath processes and the many new solvents now available in unlimited quantities at low prices would appear to offer interesting possibilities for developments along this line, but the reluctance of all textile plants to adopt solvent processes of any kind, on account of both the health and fire hazards involved, and the high cost of most solvent processes where solvent recovery equipment is not used, has prevented these solvent processes from coming into use for any but special purposes.

In Japan and China, where the stencil printing of textiles is conducted on a large scale, waterproofed paper stencils are widely used. In Japan it is claimed that some of these are waterproofed by the application of persimmon juice, but the author has not witnessed the process. The stencil paper is dark brown in color, tough, and should prove useful for other purposes. Some of the Chinese stencil papers, which resemble the Japanese papers, are treated with tung and other oils.

Rubber and Latex

The rubber coated fabrics are so well known that they require little discussion. The rubber is usually applied as a thick dough, by spreading, on special equipment. The greatest improvement along these lines has been in obtaining better adhe-

Boy's rainwear ensemble made of rubber coated fabric in Du Pont's high visibility chrome yellow color.

sion between the rubber and the fabric, and by increasing the life of the rubber in use.

The availability of rubber latex appeared to open tremendous possibilities in the waterproofing of textiles and many other things but, as a whole, the results at first obtained on fabrics were disappointing. Difficulties were encountered due to the coagulation of the latex during application, irregularities, probably partly due to creaming of the latex, stickiness of the treated material, probably due to the presence of non-rubber material (protein?) in the latex, etc., etc., so that the seemingly simple processes have not come into very general textile use.

Rubber Coating Wool

One of the latest developments (patented) along this line, particularly for woolen materials, is to first impregnate the material with a suitable cation-active agent. This causes the emulsified rubber to have a direct affinity for the treated wool and it is possible, in this way, to "dye" the rubber onto the surface of the wool fibers, in somewhat the same way that a dyestuff is applied. It is claimed that as much as ten or fifteen per cent. of rubber will be taken up by the wool, that the latex bath can be practically exhausted, and that the rubber can be fixed on the goods to give many new and desirable effects. As yet, this process has not come into wide use in the the U. S. A. The idea is new in the textile industry and may have applications other than waterproofing.

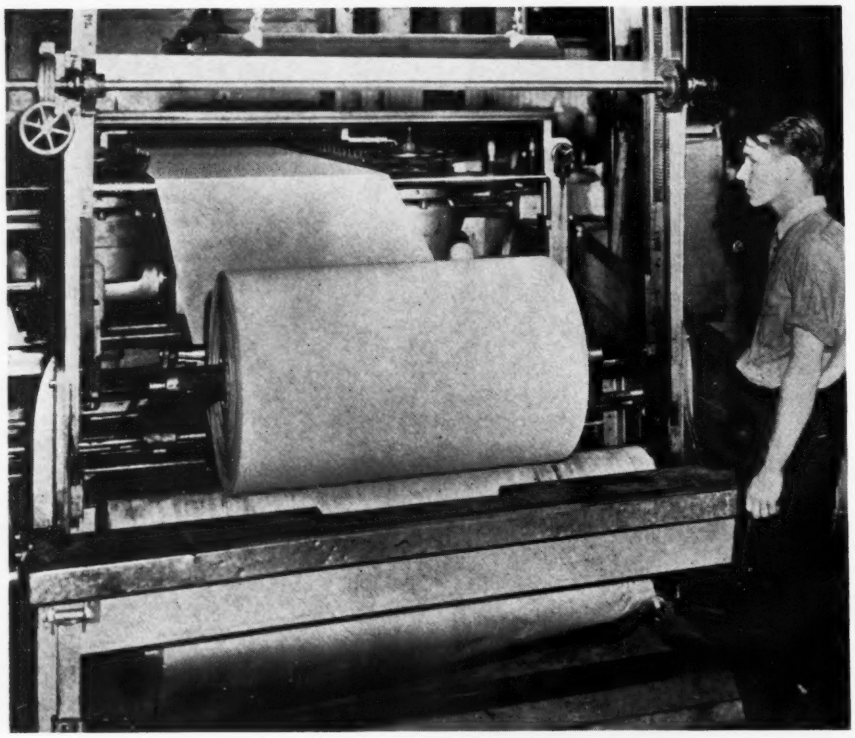
Many of the early synthetic resin patents proposed to apply the resin products or components to textile materials to give certain effects, including greater resistance to wetting, etc. That none of these early processes were practical for textiles, etc., is indicated by the fact that none of them came into general use for waterproofing purposes. The first practical use of the synthetic resins in textile finishing was the result of research in the Tootal Broadhurst Lee Company's laboratories on the crease-proofing of cellulosic materials. Due to the success of the process covered by these patents, innumerable other resin and other processes have been proposed involving the deposition or formation of the various resins on or in the different textile fibers or filaments, for a variety of results. We would expect that at least some of these resin processes would cover waterproofing.

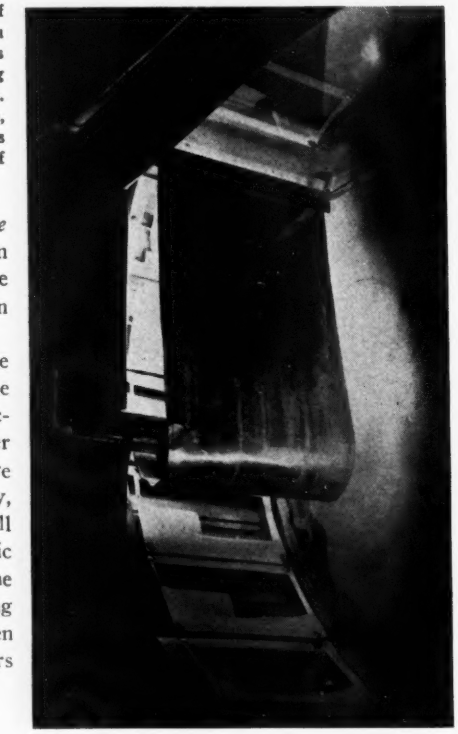
Synthetic Resin Application

As previously indicated, the synthetic resins are applied to textile and many other materials, both for waterproofing and other effects, by several different general methods, that is, as either aqueous or solvent solutions or emulsions of the synthetic resin components, as solutions or emulsions of the partly formed resins themselves, or as solutions or emulsions of the completely, or nearly completely formed resins. As would be expected, the waterproofing and other results obtained differ widely with the many resin materials used as well as the details of their application to the textile or other material.

Besides the innumerable resin combinations available for application to textiles in various ways, the results differ greatly according to whether the resin is on the external surface of the fiber, as a coating material only, deposited within the interior of the fiber itself, or both. Obviously, the conditions, both as to fiber and resin, under which the resin or its components are applied to the fibers, the physical condition of the fibers themselves at the time of application, and the after-treatment of the resin-bearing fibers, very greatly affect the results obtained with any one combination of resin and fiber.

In the now famous crease-proofing processes, the partly formed (urea, thiourea or phenol-aldehyde) resin is applied to the cellulosic (cotton or rayon) fibers or filaments in such a manner as to cause as great a proportion as possible of resin to be formed *within* the fiber or filament. That part of the resin formed on the fiber surface is removed as completely as possible in the after treatment. These crease-proofed fibers are not waterproof. On the other hand, when certain resins





Machine above applies pyroxylin waterproof coating to fabrics at Newburgh, N. Y., Du Pont plant. At right is machine which gives pyroxylin coated fabrics an accelerated ageing test which simulates actual service conditions. Material is thoroughly wetted in water bath, then carried under a battery of strong lights which dry it out quickly with a degree of heat not encountered in everyday use.

are deposited or formed on the *surface* of the fibers or filaments, or even within them, the hydrophobic properties of the material (fabric, paper, etc.) is often increased.

It has been proposed to apply a wide variety of the synthetic resins to textile and other materials by innumerable processes to obtain waterproof and many other effects. The results often vary even more widely than might be expected. Naturally, the water-resistance of the material will vary considerably with the hydrophobic properties of the particular resin used, the amount of resin present, etc., etc. Among others, the polyvinyl resins have been used for waterproofing, but many others may be equally satisfactory.

Manner of Application

Among other things, the state or physical condition of the fiber itself at the time the resin is applied is a considerable factor in the ultimate success of all resin processes. If the resin is applied as a solvent solution (varnish) to the dry and unswollen cotton fibers, usually only a thin surface coating of the synthetic resin is formed on the fibers. This film, in itself, may be quite hydrophobic but, just as soon as water or moisture penetrates this outer shell of resin, the cellulosic fiber starts to swell and very soon the shell of resin is ruptured and falls away from the fiber, with loss of all waterproofing effect.

If the resin is applied in an aqueous or other solution or emulsion, either as a partly formed resin or its components, the results also vary with the physical state of the fibers or filaments as well as the state of the resin, but if the resin-forming materials are applied as an aqueous solution or emulsion to the highly swollen cellulosic material, such as results from the action of caustic alkalies (sodium hydroxide) on cellulose under mercerizing conditions, the resin or its components often penetrate the surface of the cellulose fiber or filament, thus offering a much better adhesion than in the previously mentioned case. Where resin processes are used for waterproofing, care must be taken to avoid a crease-proof effect as this involves patent infringement.

As with most other waterproofing processes, not all synthetic resin processes are equally satisfactory on all fibers. In many cases, other materials, such as waxes, rubber, plasticizers, etc. are applied with the synthetic resin. In most cases, the presence of the resin in the fiber affects properties other than its resistance to wetting. As a class, the synthetic resins on the surface tend to make the textile material harsh and stiff and considerable softener or plasticizer must be used to overcome this unwanted stiffening. Among other effects, one patent mentions that wool impregnated with certain synthetic resin material shrinks less than untreated wool.

United States Patent No. 2,090,593, covers the use of oleyl-urea, stearyl-urea, benzoyl-, phthalyl-, benzyl- and other ureas for waterproofing paper, textiles, wool, etc., and for other purposes.

United States Patent No. 2,111,698 states that the water resistance of wool, silk and other nitrogenous fibers and filaments is increased by impregnating with an aliphatic of cycloaliphatic compound containing four or more carbon atoms and capable of reacting with aldehydes, or their reaction products with aliphatic aldehydes, followed by treatment with an aliphatic aldehyde and heating.

British Patent No. 480,958, covers the use of glucose ureide, with or without phenol or urea with formaldehyde.

British Patent No. 485,593 proposes to treat wool, silk, etc., in an aqueous lactic acid bath, to acid reaction, followed by a bath of carbon tetrachloride containing montanic acid methyolamide. The treated material is heated.

In British Patent No. 488,787, paper is treated with a polyvinyl resin solution. The paper should be gelatin sized before, after, or during the resin treatment. Latex, oils, waxes, etc., may be added.

British Patent No. 508,711, covers the use of resins for both crease-proofing and waterproofing effects on textiles. The urea- or thio-urea resin is applied in the usual manner to give the crease-proof effect, after which a layer of non-thickened acrylic or vinyl resin emulsion, such as Plextol D114, is spread on one side only of the goods. After drying at 65 to 70° C., another layer of resin is applied and this can be repeated as often as desired.

Canadian Patent No. 358,953 covers the use of petroleum wax carrying in suspension coumarone or phenol-formaldehyde resin.

French Patent No. 799,162, states that paper, cloth, viscose, etc., can be water-

proofed by the use of polyvinyl alcohol with aldehydes, paraffins, waxes, chloronaphthalenes and plasticizing agents.

Other Coated Fabrics

Obviously, many of the previously discussed waterproofing products can be applied, either alone or in combinations, to give coated rather than impregnated effects on fabrics, etc. In many cases, it is impossible to draw a strict line between coating and impregnating processes, and often a heavily impregnated fabric is really coated, as practically all of the pores of the material are closed. From the standpoint of waterproofness, the closing of the pores of the fabric is often very desirable, but, from the point of the comfort of the wearer of a waterproofed coat or other garment, closing the pores is certainly not desirable, as the air-impermeable fabric will not allow the body to "breathe," thereby causing discomfort due to the accumulated moisture, perspiration, on the body. This is one of the chief objections to coated garments.

Coated fabrics are used for many purposes other than wearing apparel. Common oil cloth and the heavier, burlap base linoleums, are in reality coated fabrics. Most of the artificial leathers are also coated fabrics. Almost all of these are waterproof and many of the processes and materials, and some of the equipment used in their manufacture, resemble those used in the manufacture of the coated or impregnated type of waterproof fabrics, etc., under discussion. However, the manufacture of oil cloth, linoleum, artificial leathers and most coated leathers, including "patent" leather, is usually considered as quite outside of the subject of waterproofing.

"Oiled" Silk

"Oiled" silks were in wide use in the Orient long before they appeared on our markets and probably obtained their name from the native tung oils used in their production in the East. The original processes required considerable time for drying, but the newer processes used in the West, utilizing special "varnishes," require much less time for drying and, in some cases, give products that have both a greater life and beauty. Most of these varnishes are prepared by the regular varnish manufacturers from special formulas developed for this special use.

There are few patents covering oiled silk manufacture at present, probably for the reason that, on account of the age of the oiling process in the Orient, it is very difficult to obtain a valid patent in most countries. Probably many of the "varnishes" used in their production are covered by patents, but the exact compositions used for fabrics probably differ somewhat from that of similar products used on wood or other materials, usually for decorative and protective purposes only.

It appears that some of the long (tung) oil spar varnishes may give a suitable material for experiments along this line. Solvents, thinners and catalytic dryers may improve the results and speed up the process, but care must be taken to avoid metallic dryers that also catalyze the deterioration (tendering) of the oiled fabric. Some of the colorless synthetic and natural resins, solvent-soluble cellulose esters, particularly the mixed esters, and ethers, varnish gums, tung, linseed and other drying oils, are interesting components. It is necessary that the finished fabric does not become stiff, brittle, tender, or sticky with age or at temperatures slightly above those normally encountered in use.

Painted fabrics are mostly used for awnings, screens, theater curtains, etc., and a considerable amount of special paint is used in their preparation. In many cases, the result desired is more decorative than waterproof and certainly not all of these materials can be considered as "proofed." Some effort has been made to develop painted fabrics, for theater curtains, floor coverings, etc., that are also fire-proof. The special requirements of a paint for a fabric for some special purpose may vary widely from that of the best protective paint for wood. Usually speed of drying is very desirable, as well as high covering power. Titanium pigments often aid covering power. Flexibility is often desirable and plasticizers may be necessary. As for oiled silk, catalytic dryers must be selected with care and oils that promote ignition on drying must be avoided.

The latest commercial development in the waterproofing of textiles is that of the Imperial Chemical Industries, a product sold abroad as Velan, and by the Du Pont Company in the U. S. A. as Zelan. The development of this product has opened up, from the practical standpoint of the textile finishing plant, a whole new field of textile chemistry. This process, and the other patents along this line, are so important that they will be covered by a separate paper, to appear in an early issue of Chemical Industries.

New Steel Making Process

Announcement of this new steel making process has been withheld by Allegheny Ludlum Steel Corp. until after the product of "Pluramelting" could be announced as immediately available in some commercial forms. In the oil refining industry, pressure vessels made of "Pluramelt" have been in actual service for over two years.

The chemical industry, the petroleum industry, the food and beverage industry, the paper industry—all use vessels that require strength against the pressures carried, and resistance to corrosion. High pressure sometimes demands wall thicknesses of two or more inches of steel, yet only the inner surface of this must resist the corrosive contents. It seems extravagant, states the announcement, to make a vessel of solid stainless steel when a thin layer of stainless over a plate of medium carbon steel would serve just as well.

Considerable progress has been made and many difficulties overcome in the production of stainless clad materials.

Several firms use the process of heating slabs of the two metals in contact and then rolling or forging the combination. A second method is that of pouring the liquid melt of carbon steel around a solid section of stainless steel. A third method has been to build up a series of thick overlapping beads of stainless steel weld rod on a carbon steel backing, then machining the surface and rolling the combination to finished size—evidenty a costly operation for a product that is likely to contain many imperfections in the weld metal. More success has been achieved by the method of placing a thin sheet of stainless upon a steel plate of proper thickness and then spot welding them together on close centers by electrical resistance methods. In order to better fulfill requirements research and investigation were started. It was found that ingots produced by all of the present-day steel making processes have certain characteristics in common. Each ingot is formed from the freezing of a melt of single composition so that the final ingot is of relatively uniform composition throughout. In properly deoxidized steels, no dependence is placed upon the hot rolling or mechanical working for the bonding or joining of the particles in any portion of the metals. Because of the singleness of composition of ingots produced by these well-known methods, these processes could be termed "monomelt". In the production of clad materials, it was, therefore essential that both component analyses be, at least in part, molten at the same time, in order to secure absolute metallic continuity. Such a process could evidently be described by the words "Plural melting" or simply "pluramelt". After intensive investigation, this result was accomplished by means of a special type of electric arc melting furnace so designed that the melting operation could be carried on and the final product would be intermelted with any other metal part and allowed to solidify as an inseparable portion of the mass.

Pluramelt in its numerous analyses is the product of an electric furnace melting technique, as a result of which all of the special composition materials and a small part of the low-cost materials are melted and integrally joined.

Sales Development—

A New Technique

By Logan Grupelli, Manager, Market Development Department and J. Miskel, Assistant, National Oil Products Co. Inc.

ONE of the pressing problems facing the chemical manufacturer today is the difficulty in keeping pace with the creative ingenuity of his research staff, the progress of chemical industry as a whole, and the technological developments taking place in chemical-consuming industries. The manufacturer must see that his products are effectively evaluated with respect to their full potential application to new problems arising from technological progress in industry. He must be sure that his research and development trend corresponds to present and future markets; and he must see that the ideas, processes, and products resulting from his research program be given exhaustive and conclusive examination.

In the past, each of these problems was considered separate and treated as such. Sales Promotion was given the task of determining the "new use" potentialities of regular-line products, along with its task of sales expansion. It was "Market Research's" sphere to evaluate present and future markets in all their phases as a guide in establishing research trends. New products, processes and ideas were entrusted to one or more sales divisions, or there was a special department established to see that these were not overlooked in the attention given to their more sturdy brothers in the company line.

It is apparent then that the development of new uses for old products, the utilization of the products of research, and the evaluation of market trends are all interrelated. If these functions are executed separately, without any attempt at coordination, it is more than likely that there will be much duplication of effort, and failure to utilize completely the information available specifically to each department. Therefore, there will be no joint attempt to evaluate industry's problems centrally so that a full exploitation of the possibilities of the company's old and new products can be realized.

Several chemical manufacturers have realized the interdependence of the hitherto separately regarded marketing functions, and in their appreciation of the fact that each, in a sense, constituted experimental marketing, they chose to combine all these functions into a department which would devote its entire attention to an attempt to conduct this experimental marketing in a unified and systematic manner.

Such departments have been hopefully defined as research units, designed and set up to translate technical developments into industrial practice. We say hopefully because as far as we know, the "modus operandi" of such departments is in some respects still in the process of evolution. This is borne out by the fact that no two departments, to our knowledge, operate entirely along the same lines. The names usually given the units or departments vary, which is to some extent also significant of their evolutionary character. However, for the purpose of discussion, let us designate such units' functions as "Market Development," a name, by the way, adopted by our organization and in a large measure descriptive of its functions.

The average "Market Development Department" does not by any means presume to usurp any of the functions normally relegated to sales, sales promotion, advertising, technical sales, etc., but rather to use the devices employed by each to best advantage in the solution of the problems at hand. Simplified, its primary function entails the collection and study of information provided by the company's research staff, technical literature, sales information, market surveys, etc., and then attempting to utilize the accumulated data for the evaluation of markets from a research standpoint, as a basis for determining use and new use potentialities for new and old products, respectively.

In order that we may appraise the value of a coordinated utilization of technical developments in marketing, let us briefly look over the mass of material available to the average progressive chemical manufacturer and which, many times, is haphazardly or sporadically turned to account.

The company research and service laboratories are probably the primary and most important sources of information, particularly information that relates to products. They, in addition to providing many "use" suggestions, are the first-hand observers of new and novel properties and modifications of products which very often lead to new market possibilities.

Often Find New Uses

How often has the solution of a customer's problem, handled as a routine service, disclosed a new valuable use for a product whose potentialities were considered exhausted? Again, how much potentially valuable information is gained in service work, which if dove-tailed with a problem known to the sales department would open up a new market? It is evident that a systematic collection and appraisal of the valuable data tabulated in laboratory and service reports presupposes a fuller utilization of this material. In any case, the information will become an active part of the product, rather than buried in voluminous technical files.

Second, but of equal importance with the laboratory as a source of marketing information, is the Sales Department.

Figuratively speaking they have their fingers on the pulse of industry. The average chemical salesman has the opportunity to discuss industrial problems with research directors, chemists, superintendents, and technically trained purchasing agents in the many industries that it is his privilege to contact. The salesman, in most cases, collects considerable data regarding samples submitted, and in this way gathers first-hand information regarding the problems peculiar to each industry. These industry problems are either in time solved by him, with possibly some service work on the part of the laboratory, or else they become lost in the accumulation of salesmen's reports. These unsolved problems, on the other hand, can and should form the basis of the company's investigational program.

Published chemical and industrial literature may be considered as a third source of technical data which must be constantly surveyed in order to keep appraised of research and industrial trends, as well as serving as a guide to present and future marketing possibilities.

Last, but not least, in the array of marketing weapons we stress the market survey as a source of information. It is deliberate and objective. Its scope is predetermined and its goal definite. As far as market development is concerned, surveys are undertaken to check and supplement other sources of information and naturally restricted to specific fields.

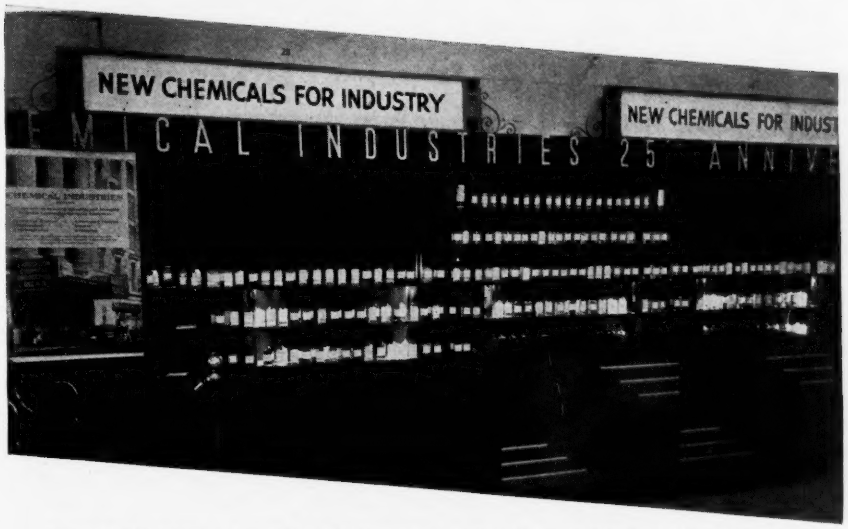
Proper Correlation Needed

While each of the above sources of technical information are in themselves separate and independently valuable, it is only through proper correlation and coordination that their value is fully applied. Separately they present the enigma inherent in a mass of unsolved problems on one hand, and a wealth of technical information on the other, neither doing much to help the other.

Historically, the market development department may be considered as the logical culmination of a number of changes wrought in the chemical industry itself, and in the chemical consuming industries.

Not so many years ago, the chemical industry became a leader in championing the idea of progress through research. Starting with modest appropriations, the research programs grew from year to year. This soon led to an astounding amount of new and remarkable products. Research literally outran industry.

Naturally, many of these products were developed because of a definite need and therefore readily found use. On the other hand, there developed through accidental discovery, or as by-products, or as intermediate chemicals, a number of orphan products for which no use was known. To make use of these "orphans" became a problem.



Some of the large and varied collection of new chemicals exhibited at last December's Chemical Exposition held in New York City, indicating the real need for an intelligent approach to the problem of finding profitable markets for the host of new products coming out of the research laboratories of the country.

Most of us who attended the Chemical Exposition were no doubt impressed by the large and varied collection of new products displayed in the CHEMICAL INDUSTRIES booth. These were, of course, research's showpieces,—how many of their less fortunate brothers remained on a dusty shelf, lacking any raiment of utility? The salesmen carry these around for spare-time work, and apologetically introduce them to customers as new products which might work for this or that purpose.

Paralleling this development, the industrial laboratories were undergoing a change, also. Originally they were set up, at least in a large measure, as analytical and control laboratories for raw materials. However, they soon outgrew this limited scope and took on more of a research complexion. They began to take interest in the salesman "orphans" and saw the possibilities of cutting costs or of improving their processes and final products.

All this culminated in the present-day large research programs (millions for 1939) on the part of the chemical manufacturer, and on the part of the consuming industries as well. These large expenditures are made on the carefully studied needs of present and future markets, and other factors. Yet, in spite of well-laid plans, the very nature of research results in the direct or indirect production of "orphan" products.

On the shelves of many research laboratories can be found new products begging for some use, or at least a sufficient outlet to justify the erection of a small production unit. Finding a home for each of these "orphans" is industry's big job today.

Who is to do it? The Sales Department? The Sales Promotion Department? The Market Research? The answer is almost obvious.

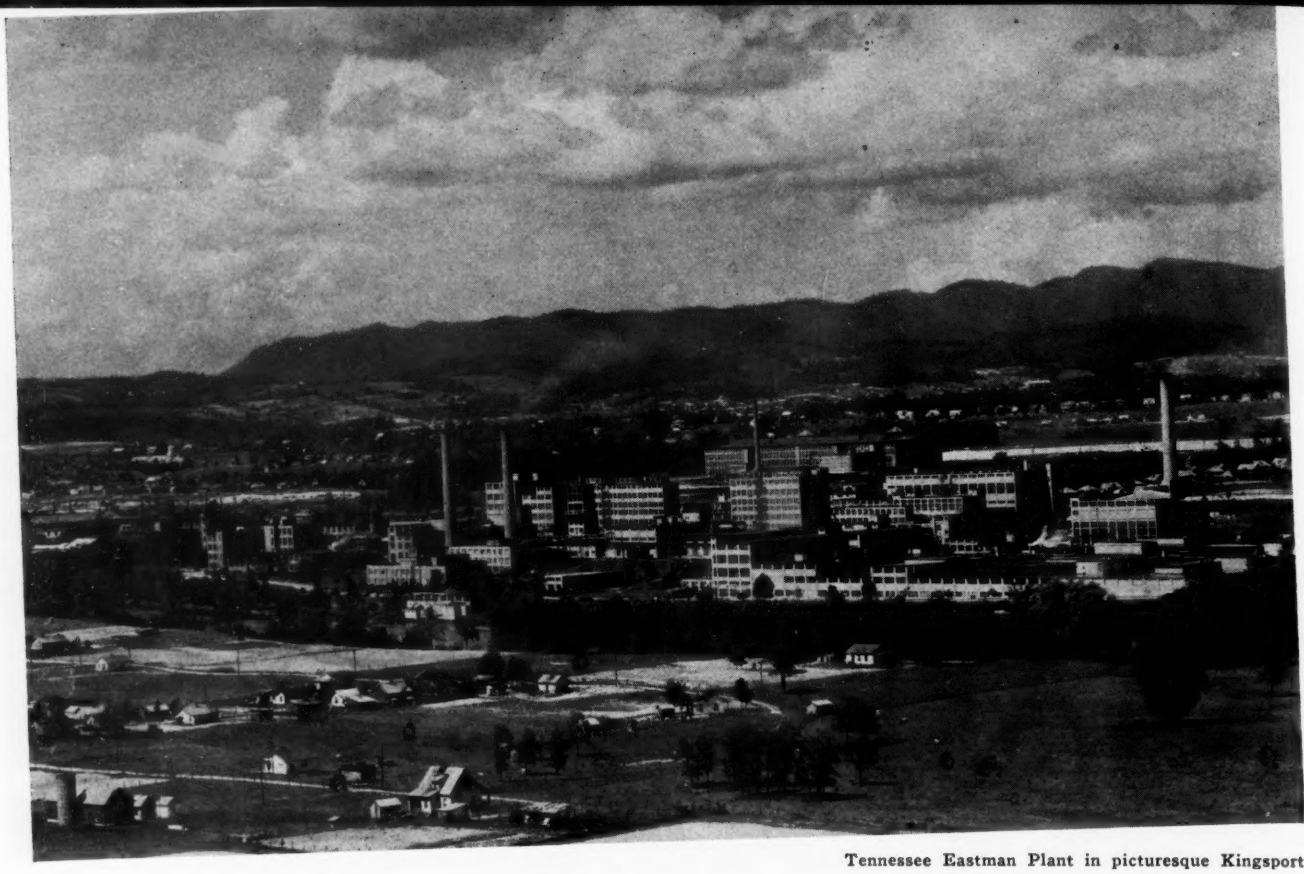
Launching a new product properly is a task requiring considerable amount of time, work and ingenuity. It is a pioneer sales effort, requiring special knowledge of markets and industrial processes. You start by intensively analyzing your products. You then seek to satisfy a specific demand in industry through them. It requires imagination and research patience. Clearly, such work necessitates a special department geared for the business of correlating many functions into one definite marketing effort.

It is our opinion that as time goes on, such departments, linking the research with pioneer sales efforts, will become of ever increasing importance. Much the same as the chemical engineer has made use of the pilot plant idea in the transition from test tube to large-scale production, so the market development task is to reduce the magnitude and frequency of errors in the translation of an idea to practical fruition.

We have endeavored to present by way of introduction a general conception of what market development means. In future articles we hope to be able to discuss organization and methods in detail, especially such subjects as market surveys, collection and analyses of technical data, cooperative work with universities, colleges, and research laboratories, and the keeping of records.

Metal Cleaner

New materials for stripping off coatings of baked enamel, and for cleaning the usual shop grease and dirt from new metal parts have been announced. These compounds are suited for quickly and economically cleaning metal surfaces preparatory to finishing. They are sold in crystal form and dissolved in water according to the directions given by the manufacturer.



Tennessee Eastman Plant in picturesque Kingsport.

KINGSPORT, TENNESSEE

A Mid-Southern Center of

By

Chester H. Penning

KINGSPORT, a fast-growing little city in the northeastern corner of Tennessee, has in the past few years received quite a bit of publicity in a number of publications of wide circulation (list in footnote). None of these articles, however, has emphasized one point about this community which should be of interest to readers of CHEMICAL INDUSTRIES, and that is the fact that most of the industrial plants contributing to the life of the people are chemical in nature.

The builders of the Clinchfield Railroad are responsible for the development of Kingsport as it exists today. In 1909 this road had been completed from Dante, Virginia, to Spartanburg, South Carolina, connecting with the Southern Railroad at the latter point and at Johnson City, twenty miles south of Kingsport. New industries were sought as a means of developing traffic for the railroad. Old Kingsport had been the head of navigation on the Holston River, which feeds into the Tennessee; it was named for Col. James King, who established a warehouse here for the storage of salt from his mines in Saltville, Virginia. This traffic had long since disappeared, however, and there was little but a cluster of old homes remaining when the railroad put in its appearance. But within the area were many natural resources—a wealth of timber, large supplies of shale, limestone, silica and coal—and it has been stated that a car loaded with these materials on the Clinchfield 80 miles north or 100 miles south of Kingsport if turned loose would roll into the city without motive power. There was also in the surrounding country an almost 100 per cent. pure American population—perhaps more significant for the development of the community than any other factor. Even today, after the population has grown from practically nothing in 1910 to 5,700 in 1920, 12,000 in 1930 and an estimated 35,000 in 1940, there is a remarkably small percentage of foreign extraction.

There is probably no city in the United States of nearly the same size that can claim as many establishments under different management producing such varied products requiring chemical control in their manufacture. Where else within a radius of three miles can one find such a varied array: a cement plant, a paper mill, brick works, flat-glass factory, bookcloth and window shade manufacturer, cotton piece goods bleachery, a foundry for special alloy castings, a producer of oxygen and acetylene, a hard-wood distillation plant, and a manufacturer of cellulose acetate, cellulose mixed esters, acetate rayon, acetate rayon dyes, glacial acetic acid and anhydride, and thermoplastic molding compositions?

Kingsport was first brought to the attention of the chemical world during the World War by the establishment there of the Federal Dyestuff and Chemical Company, an organization that promised to be the largest dye manufacturing plant in the country. In May, 1918, the Electrochemical Society, on a trip from Washington to Muscle Shoals and Birmingham, spent a day in the city, primarily to see the Allen electrolytic chlorine installation in the dye plant, though the Proceedings of the meeting tell of visits also to the Kingsport Extract Corporation, Kingsport Tannery (125 hides daily), Kingsport Pulp Corporation and the Clinchfield Portland Cement Corporation.

The Board of Directors of the society, impressed by the possibilities of the dye works and concerned over the fact that the government was not utilizing its facilities to the greatest extent, made a recommendation that the plant be investigated. At least partly as a result of this the government on May 11, 1918 took over the plant at government terms. There were in the plant some 1,000 employees, of which 10 per cent. were chemists. When turned back to private

operation after the war, however, there developed considerable internal dissension, resulting not long afterward in cessation of operations. This naturally was quite a blow to the community, but it was not long in recovering.

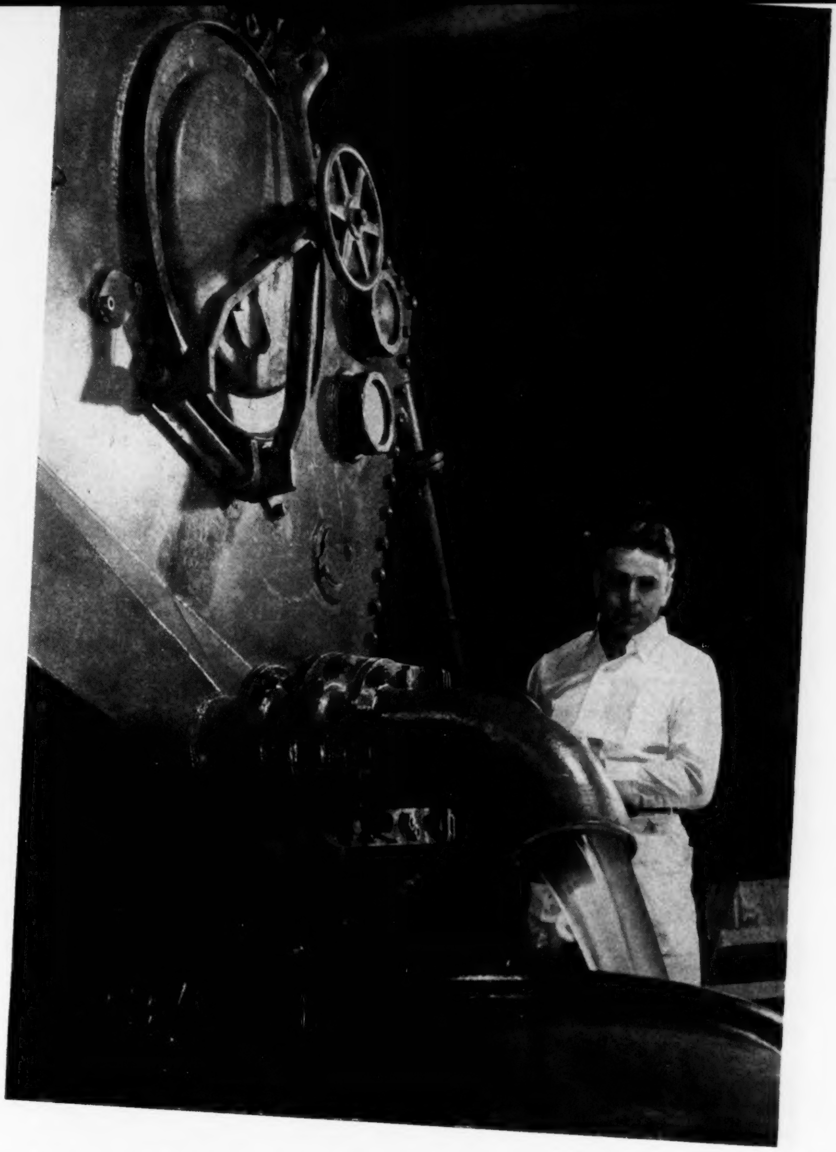
The aim of the Kingsport Improvement Company, established by the railroad to seek new industries, has been to bring about an integration in the industrial activity of the region, so far as possible without hindering any healthy development. Its progress toward the accomplishment of this objective can best be described by outlining the operations of the various plants now in operation within the city.

Blue Ridge Glass Corporation

In 1919, after an investigation covering the entire country, Corning Glass Works selected Kingsport as the site for a plant for the manufacture of Pyrex glass. The plant operated but a few months before it was closed by the depression of 1920, to be opened again in 1926 as Blue Ridge Glass Corporation, a corporate offspring of Corning and two foreign concerns—St. Gobain, Chauny et Circy of Paris (incorporated in 1665) and Glaceires Nationales Belges of Brussels.

Sand, soda ash and lime, obtained from

Chemical Industry



Cellulose acetate pouring from acetylating mixer at Tennessee Eastman plant. Acetate is produced from cotton linters, catalysts, a vinegary solution of acetic anhydride and acetic acid.

the Carolinas, Virginia and Tennessee, form the raw materials from which this firm makes its products, using producer gas made from coal mined in Virginia and Kentucky. Two continuous tanks are installed for the production of rolled figured glass and rolled and polished wire glass. The Lewis-Pond continuous process for wire glass was developed here in 1929. This process, involving the insertion of hexagonal wire mesh in the center of glass sheet while in the molten state, is now used generally in place of the old process whereby wire was sealed between two sheets of glass in a plastic state and the composite then passed through a pair of heavy rollers. The manufacture of wire glass was further perfected here in 1930 by chrome-plating the wire, thus preventing oxidation before the sheet is formed. This procedure is exclusive with Blue Ridge.

The French Boudin process is used to process continuous sheets of rolled figured glass. The hot glass from the tanks passes between metal rolls, one smooth, the other carrying the desired pattern, to make sheets from 1/8 to 1/2 inch in thickness and up to 60 inches in width, with of course, any desired length, though 144 inches is the maximum commercial size. The corporation's products are noted for their brilliant luster, flatness, uniformity of thickness, ease of cutting and adaptability of design. While the greater part of the production is the ordinary soda-lime glass, a special low-expansion heat-absorbing glass has been made since March, 1938, marketed under the trade name AKLO. This and other products of the plant are being distributed exclusively by Libbey-Owens-Ford Glass Company of Toledo, thus accounting for the fact that the name of Blue Ridge is not better known to industry at large.

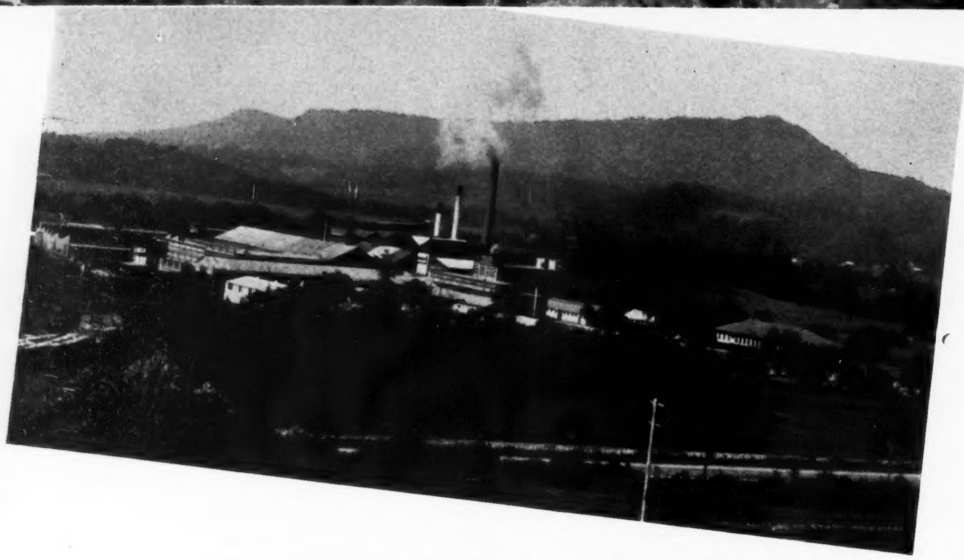
General Shale Products Corporation

Nearly all of the business buildings and an unusually large percentage of the residences in Kingsport, even in the more modest sections, are constructed of brick—most unusual in a small southern town. They are the product of the city's second oldest manufacturing industry, started in July, 1910, as Kingsport Brick Corporation, practically rebuilt in 1927 and now known as General Shale Products Corporation, with 31 bee hive down-draft kilns, each having a capacity of 75,000 bricks, and 42 drying tunnels. Using shale from the same source as that used by the cement plant, the brick works accounts for 600 cars of coal coming into the city each year, with an average of 4000 cars of bricks annually moving out. The daily output exceeds 135,000 common and face bricks daily, all sizes of hollow building tile, and a new building block, Speed-Brik.

Many chemical and allied companies now have plants in Kingsport, a town nestling in the foothills of the Blue Ridge mountains in northeastern Tennessee. Our author discusses the industrial migration to this pleasant region, and describes the businesses now located there in large numbers.

Holliston Mills of Tennessee, Inc.

The principal plant of Holliston Mills was established in Norwood, Mass., in 1893. In line with the southward trend of the textile industry, when increasing business required the erection of a new plant in 1926, Kingsport was selected as



Above—Kingsport plant of Pennsylvania-Dixie Cement Corporation. Below—Blue Ridge Glass factory nestling in foothills of Tennessee mountain range.

the site because it was near the source of the principal raw material—unbleached gray cloth. In fact, Borden Mills, Inc., already located in the city, could furnish certain types of gray goods, and the Kingsport Press, Inc., was already a large customer of some of the parent company's products, which are primarily book cloth and window shade cloth, as well as cloth for serviceable labels and tags, and other purposes.

The Kingsport plant bleaches the gray goods for both Holliston plants and in addition, does bleaching, sizing and dyeing of piece goods on contract, handling several million yards in a month. Bleaching is done not alone to whiten the goods but also to remove the natural oils from the cotton fiber and to eliminate other impurities which accumulate in making the cotton into cloth; the bleached cloth takes dyes more readily and gives brighter shades.

The equipment for the manufacture of book cloth and for window shade cloth is much the same. The actual finishing operations, however, differ considerably, depending upon the type and grade desired. Finishing consists principally of filling the bleached and dyed cloth with a mixture of starch, oils, talc, and clay, in which are incorporated various dyes or pigments and certain softening materials. The filled cloth is usually calendered and the book cloth embossed with a wide variety of designs. The shade cloths are primarily Hollands and machine oil opaques. No pyroxylin coated or impregnated cloths are as yet made here, since the Norwood plant specializes in that type of work.

Kingsport Foundry & Mfg. Corp.

Kingsport Foundry and Manufacturing Corporation was organized in 1927 primarily for the manufacture of heavy chemical castings. Situated in the center of a rapidly growing industrial area, the plant finds a market for its product not only in Kingsport itself but it serves parts of the east, the middle west and the south. Castings up to 15 tons in weight have been made for various process industries including soap, alkali and sugar as well as strictly chemical plants.

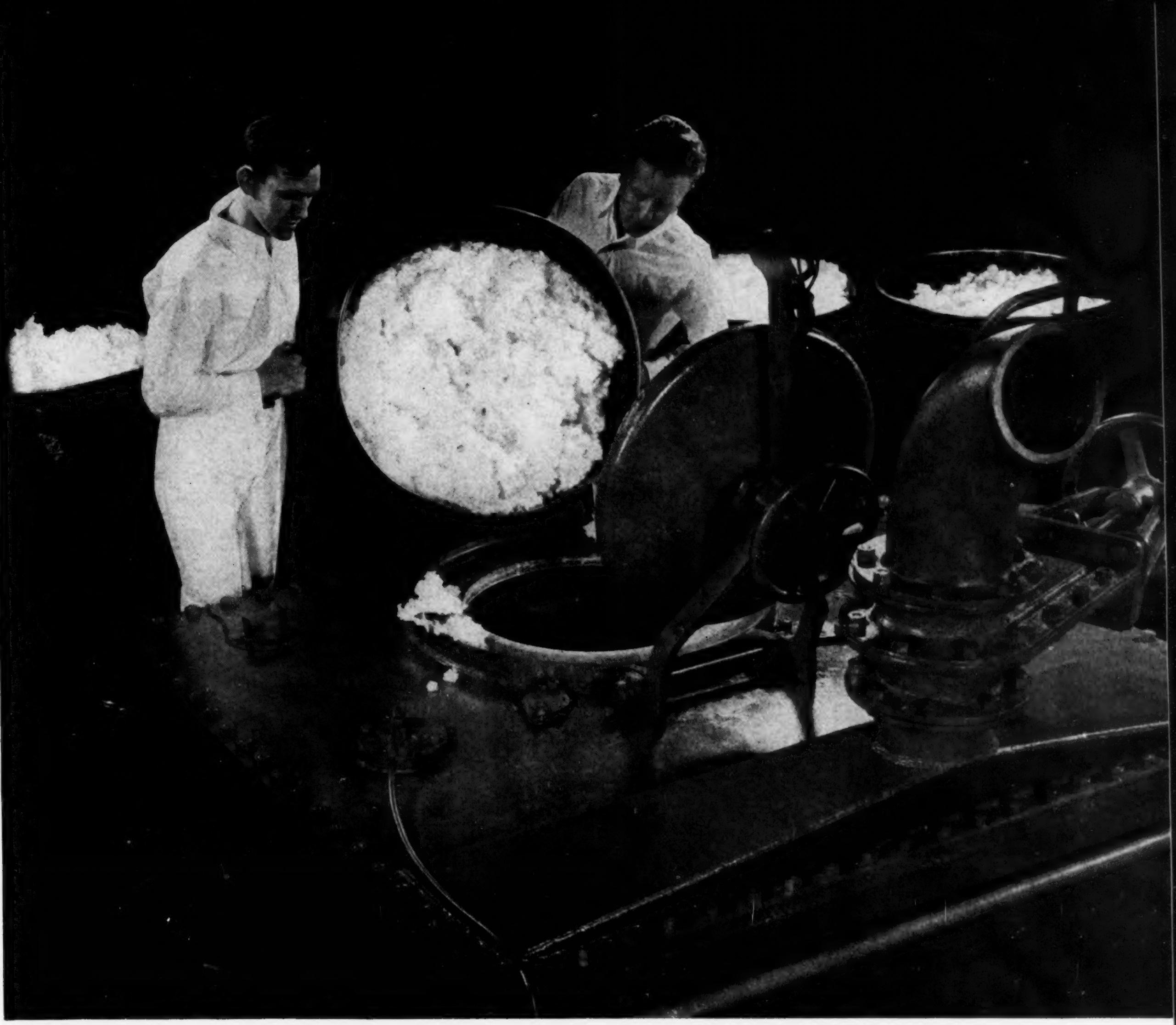
Special furnaces handle non-ferrous metals and alloys for the production of pure nickel, monel, ni-resist, bronze and aluminum castings; non-magnetic iron is cast into electric furnace machinery of various types. Other products include blast furnace equipment and all sorts of special gears, speed reducers, fans, drums, etc. A new type of coal-cleaning machinery is made here, also a rotary granulator. Pattern and forge shops enable the corporation to offer a complete service such as is not often found in a small plant.

The Mead Corporation
Kingsport Division

The Kingsport Pulp Company, forerunner of the modern plant known as the Kingsport Division of the Mead Corporation, was established in 1917, manufacturing soda pulp from yellow poplar, gum and maple gathered from eight southern states. The initial daily production of forty tons of soda pulp was doubled within three years; during the sixth year a paper mill was erected with one Fourdrinier machine, and four years later a second machine was installed.

Production was further expanded in 1937 with the installation of two more paper machines (102 inch and 160 inch trim) and equipment raising the production of pulp to 100 tons a day. Of this pulp, all soda process, approximately 60 tons are consumed in the plant, the balance being sold on the open market. Sulfite pulp from Scandinavia and sulfite pulp from southern plants are purchased to mix with the soda pulp and provide the long fibers needed for the manufacture of the better grades of paper made here—primarily book and machine-coated magazine paper, though various grades ranging from 100 per cent. soda to 100 per cent. sulfite content are produced. The machine coating process is one developed at this mill; two of the paper machines incorporating this process are being run continuously on paper made under contract for the magazine *Life*. Much of the book paper goes to the adjacent plant of the Kingsport Press. Five super-calendars, two of the latest design, put the desired finish on the product.

Both English and domestic clay (from Georgia) are used; some of the filler used is the calcium carbonate obtained as a byproduct in the manufacture of the



Beginning of cellulose acetate process at Tennessee Eastman plant. Workers are shown dumping cotton linters into acetylator.

caustic liquor required in cooking soda pulp. Soda ash comes from the Mathieson Alkali plant in Saltville, Virginia, and lime from Knoxville. Alum is made from aluminum hydrate, a by-product of the chrome ore industry, and sulfuric acid which may be obtained from the General Chemical Company in Pulaski, Virginia, or the Tennessee Corporation at Ducktown, Tennessee. Chlorine is not produced for sale nearer than Charleston, West Virginia. This plant now has about 600 employees.

Pennsylvania-Dixie Cement Corporation

In 1910, shortly after the completion of the Carolina, Clinchfield and Ohio Railroad connecting Kingsport with the Norfolk and Western in Virginia and the Southern Railroad in South Carolina, the Clinchport Portland Cement Company started erecting a dry-process cement plant with an annual capacity of 1,500,000 barrels. Shale from the plant site, limestone from a quarry just over the Virginia state line six miles away, and gypsum from the Saltville area in Southwestern Virginia, provided raw materials at low cost. Soft coal hauled in by the railroad from nearby Virginia and West Virginia fields provided heat and power.

This was the pioneer plant in the southeastern states. Kingsport was selected as its location not only because of the proximity of raw materials, as mentioned above, but also because even at that early date the section appeared likely to become an important industrial area. Since then some seven or eight other cement plants have been erected within what was originally this plant's territory, so there have been no additions to the original equipment of the plant, which comprises six 8 ft. by 125 ft. kilns, with the accessory grinding and pulverizing equipment of the dry process.

The plant is now one of the eight comprising the Pennsylvania-Dixie Cement Corporation, organized in 1926.

Tennessee Eastman Corporation

Tennessee Eastman Corporation, a subsidiary of Eastman Kodak Company, was organized in 1920 as a producer of wood chemicals. The parent company had experienced difficulty during the war in obtaining sufficient methanol for its needs as a solvent for nitrocellulose in the manufacture of photographic film, and it sought a source of supply under its own control.

Land and timber rights were acquired in Virginia and Kentucky as well as in Tennessee, amounting at one time to approximately 40,000 acres, from which hardwood (perhaps 70% oak, the balance mostly poplar) was and is still being cut and carried in part by the company's own 30-mile railroad to its 8-foot band mill having a capacity of 35,000 board feet per day. The lumber produced finds many uses; not a small portion of it is consumed in the company's own planing mill and box plant, where the boxes used in shipping other products are made.

The limbs and tops of the trees and the slabs and ends from the sawmill, together with such cord wood as is hauled in by farmers in the surrounding territory, form the raw material for the wood distillation plant. With 14 retorts, using 5-foot wood instead of the usual 4-foot lengths, the installation consumes an equivalent of 160 cords a day. In addition to furnishing the Eastman Kodak Company with their requirements of C. P. methanol, the balance of the solvent production is sold to industry for a variety of purposes.

Charcoal

The co-products of methanol in a wood distillation plant are charcoal and acetic acid. At the Tennessee Eastman plant a large part of the production of charcoal is used in the manufacture of CHARKETS, a briquetted form, which are used as a clean, slow-burning fuel for railroad dining cars, steamships and

Holliston Mills of Tennessee, Inc., established its plant in Kingsport in line with southward trend of textile industry. Factory is branch of Norwood, Mass., plant, founded in 1893.

hotels. CHARKETS are also used to heat refrigerator cars in the north during cold weather, to provide heat for curing high-grade tobacco, and for smoking ham and bacon. Other forms in which charcoal is marketed include granulation for poultry feed and case hardening of metals and lump for smelting operations, the production of carbon disulfide and for domestic purposes.

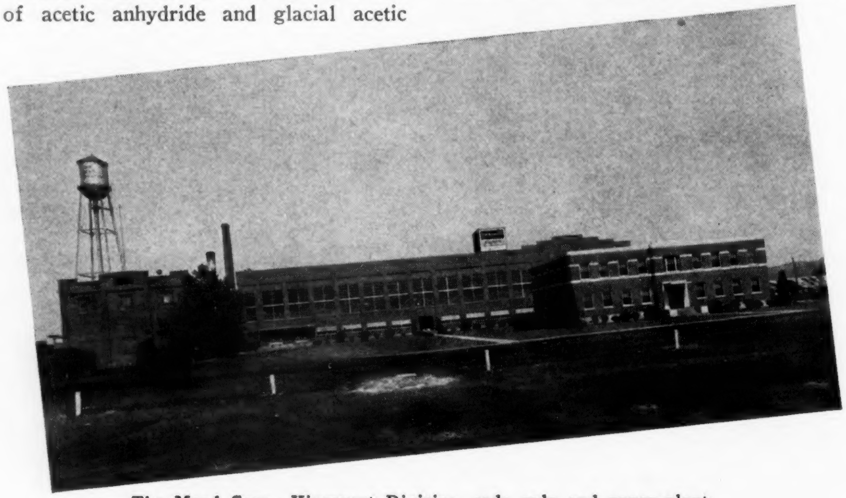
Acetic Acid

The acetic acid in the pyroligneous acid was originally recovered as calcium acetate. The requirement of the Eastman Kodak Company for acetic anhydride for the production of cellulose acetate to be used in safety film soon resulted in a change in the operations in Kingsport, whereby sodium acetate was produced and converted to anhydride by the sulfur chloride process. Several years ago, however, this process was abandoned in favor of a direct acid extraction process. The acid thus produced is used in the manufacture of cellulose esters.

Cellulose Acetate

The modern growth of Tennessee Eastman Corporation began in 1930 with the initial production of cellulose acetate. Production of film for x-ray and the increasing popularity of home movies, for which safety film (made with a base of cellulose acetate in place of nitrocellulose) was required, necessitated an expansion of the operations to meet the needs of the parent organization at Rochester, and Kingsport was chosen as the site for this expansion—at the source of the two principal raw materials, cotton linters and acetic acid.

Cellulose acetate is made by the action of acetic anhydride and glacial acetic acid on cotton linters. After the reaction is completed the cellulose acetate is precipitated from solution by dilution with water; the acid must be completely removed from the acetate by repeated washings. Economy then requires that the acid in the wash water be recovered which is accomplished in some of the largest distillation equipment used in any industry.



The Mead Corp., Kingsport Division, soda pulp and paper plant.

Acetate Rayon

Demand for safety film grew rapidly, even though the somewhat higher cost of cellulose acetate required that a premium be paid for the film made from it. It was realized that this premium could be reduced by the economies of a larger scale of production than that required for film usage. The acetate rayon market offered a logical field in which such an expansion could profitably be made. To this end experimental work was started in 1928 which eventually led to commercial operations, three years later. The same exacting standards required for film type cellulose acetate were adopted in making the very highest quality product which is universally known throughout the trade today as Eastman Acetate Rayon.

In recent years a new acetate staple fiber called TECA has been introduced on the market with great success. TECA has outstanding properties which make it naturally adaptable for processing on all types of textile equipment to produce fabrics having a wide range of unusual properties.

A further development, intended to increase the usefulness of acetate yarn, is the recently initiated production of a series of brilliant, stable dyes suitable for this type of rayon, filling a much needed requirement. Chemicals which will inhibit atmospheric fading of dyed acetate fabrics are also made here.

Kingsport Foundry & Mfg. Corp., founded in 1927 to manufacture heavy chemical castings.

Tenite

Just as nitrocellulose can be made into a plastic composition known best to the world as Celluloid, so can cellulose acetate be converted into a somewhat similar form, with greatly lessened flammability. Prior to 1930, relatively small quantities of such a product were being manufactured by a solvent process which required long periods of curing of the slabs to

permit evaporation of the solvent, followed by expensive re-pressing, skiving and polishing operations to prepare the product for the market. Experimental work at Kingsport evolved a rapid method of production whereby material in any desired shade of color could be made within 24 hours, in contrast with the weeks previously required. Placed on the market under the trade name TENITE, it gained rapid acceptance. The real growth of this product, however (and of other thermoplastic molding compositions), began in 1935 with the introduction of the first injection molding machines, imported from Germany. These machines, automatic in action, tremendously speeded up the molding operation, at the same time permitting the use of smaller and less expensive molds. This brought the relatively high-priced thermoplastic materials into closer competition with the well-established phenolic plastics. The rate of growth of the thermoplastic molding industry is perhaps best stated by mentioning the fact that there are now over 700 injection molding machines of at least 7 different domestic makes in operation in the United States.

Cellulose Mixed Esters

With cellulose acetate attaining such a high degree of popularity, other esters of cellulose naturally have been investigated. Most promising of these appear to be cellulose acetate propionate and cellulose acetate butyrate, which have been produced in commercial quantities by Tennessee Eastman Corporation since 1934. These mixed esters have lower moisture absorption than cellulose acetate, are soluble in a greater range of solvents, and compatible with a larger number of plasticizers and resins. Marked improvement in weathering qualities and in adhesion to all types of surfaces is observed, giving added interest to these products for coating operations.

As a result of intensive development work an improved molding composition made from cellulose acetate butyrate was first introduced late in 1938 under the name of TENITE II.

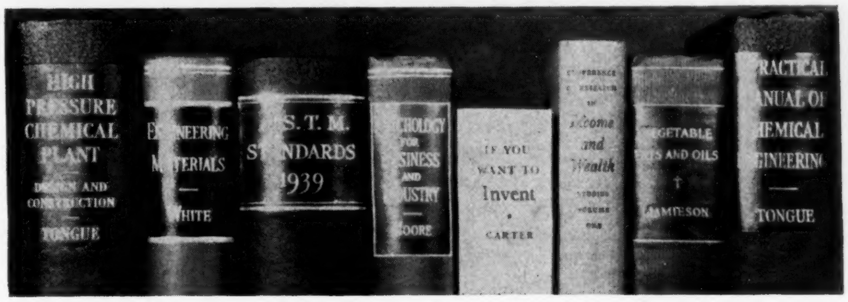
Cellulose triacetate, the unhydrolized form of cellulose acetate, is also offered for sale. Present usage is small but growing.

Experimental work directed toward the improvement of products and processes is constantly being carried on by the plant's technical staff. There are in the Tennessee Eastman personnel approximately 600 men with college or university training, among a total employment roster close to five thousand. The plant covers a 372-acre area on the Holston River, on which there are at present a total of 101 buildings.

Other manufacturing organizations in Kingsport include several smaller enterprises such as Southern Oxygen Company, making liquid oxygen, acetylene and compressed gases, and Slip-Not Belting Corporation, manufacturers of leather belting and textile specialties. Larger plants outside the chemical industry are the previously mentioned Bordon Mills (gray cloth) and the Kingsport Press, said to be the largest complete book manufacturing establishment in the world.

Articles on Kingsport, Tennessee

1. Nation's Business, December 1937—A Contrast in "Perfect" Towns, by Charles Stevenson.
2. Saturday Evening Post, 1938—Article by Garet Garret.
3. The Nation, January 21, 1939—Kingsport: They Planned It. June 3, 1939—Slum Clearance.
4. Holland's, April, 1939—Town Planning in Kingsport, Tennessee, by R. C. Morrison.
5. National Geographic Magazine, May 1939—Highlights of the Volunteer State, by Leonard Cornell Roy.
6. Factory, September, 1939—The Industrial Town of Tomorrow, by Charles B. Coates.



The Industry's Bookshelf

How Government Regulates Business. by Mark Eisner, Dynamic America Press, New York, 120 pp. The authors, competent persons, who have special knowledge and experience in government regulation, were invited to participate in presenting a series of radio broadcasts. The series has been published under the above title. It is a welcome and simple explanation of some of the principal laws and administrative agencies governing business.

Reference Book of Inorganic Chemistry, by Wendell M. Latimer and Joel H. Hildebrand, the Macmillan Company, New York, 563 pp., $4.00. A thorough revision bringing the text up to date. Recent developments in atomic, molecular and crystal structure, the atomic nucleus, thermodynamical data such as oxidation potentials, equilibrium constants and free energies have necessitated these enlargements in certain chapters and these additions have been well made.

Metalwork, by Hugh M. Adams and James H. Evans, Edward Arnold & Co., London, 335 pp. $3.00, third edition. Designed for the teaching and practice of school metalwork, this clearly and concisely written text describes manufacture of various metals and alloys. Also discusses tools, materials and procedures, etc., used in shop work.

Introduction to General Chemistry, by William Foster, Van Nostrand, N. Y.; 849 pp., $3.50. Fifth printing of the revised edition testifies to the usefulness of this textbook for colleges which has always been notable for its clean-cut, interest-rousing presentation.

The Manufacturer of Insurance, by Lawrence S. Myers, Nat'l Underwriter Co., Cincinnati, 273 pp., $3.00. For the layman and from the industrial point of view, many chemical executives will welcome this good book which covers the subject from fire to frost, from border to ocean freights.

Glass Giant of Palomar, by David O. Woodbury, Dodd, Mead, N. Y.; 308 pp., $3.00. Hail to an outstanding feat in popular science writing! Engineering tackling a stupendous job to apply practically the most precise work of physics, told with the vigorous dramatic interest of a mystery story—a book not to miss.

Uses and Applications of Chemicals and Related Materials, by Thos. C. Gregory, Reinhold Pub. Co., N. Y.; 665 pp., $10.00. A highly useful reference book splendidly done: covers 5167 chemicals and is just about indispensable. The clumsy and uncertain method of alphabetization is the only fault to be found in what is a monumental work of such value you will wonder however you have lived so long without it.

Dictionary of Scientific Terms, by I. F. & W. D. Henderson, Van Nostrand, N. Y.; 383 pp., $7.00. Biological in scope this dictionary is nevertheless of such authority and value that many chemical people will require this new third revision—a model indeed both for pronunciation and definition in a notably handsome format.

Industrial Mobilization

If WAR Comes

BECAUSE of its outstanding economic and geographic advantages the United States is self sustaining, to a degree unequalled by any other country. It possesses agricultural and industrial production facilities beyond its needs, and the essential raw materials, with certain vital and important exceptions. Surrounded by friendly neighbors north and south, and by the oceans east and west, we do not need the extensive fortifications and large standing armies of European nations. But, possessing 45 per cent. of the World's wealth, we must be prepared to protect it.

Our present armed forces include 400,000 officers and men in our Army, Navy, Marines, National Guard, and Reserves. This force should be adequate protection for any immediate emergency. Our major military outposts are at Puerto Rico, Panama, Hawaii and Alaska. Our Navy, already one of the best in the World, is being strengthened. Our Army is improving, through much needed appropriations.

In any future major war the United States may require the mobilization of an army of four million men. Adequate plans for this are of tremendous importance, possibly involving hundreds of thousands of lives, as well as the Nation's wealth and its future. Government coordination of our national resources during such an emergency would facilitate proper support of our armed forces, our war industries, and our civilian needs. All of this can be done by Constitutional processes, with individuals assuming added responsibilities, without sacrificing their civil rights.

Congress attempted to correct the many mistakes and difficulties encountered during the World War, in passing the National Defense Act of 1920. Section 5a of this Act charges the Assistant Secretary of War with the responsibility for "the supervision of the procurement of all military supplies and other business of the War Department pertaining thereto, and the assurance of adequate provision for the mobilization of materiel, and industrial organizations essential to wartime needs." By administrative order, procurement plans now provide also for Naval Munitions and Supplies, with the requirements of the two services co-ordinated by the Army and Navy Munitions Board.

By

ALBERT H. HOOKER, Jr.

Tacoma Plant

Hooker Electrochemical Co.

The President is the Commander-in-Chief of our military forces. The War Department is directed by the Secretary of War, who is the member of the President's Cabinet responsible for the Regular Army, the National Guard, and the Reserves. He also directs the Panama Canal, the Inland Waterways Corporation, and the rivers and harbors work of the Corps of Engineers. His two principal assistants are the Assistant Secretary, who acts for him in his absence, and the Chief of Staff.

The Chief of Staff is the military head of the War Department. He presides over the General Staff, which includes its Secretary, the Deputy Chief of Staff, and the Assistant Chiefs of Staff in charge of the following divisions: G-1, Personnel; G-2, Military Intelligence; G-3, Operations and Training; G-4, Supplies; and War Plans. His administrative assistants include the Adjutant General and the Officers in charge of Reserve Affairs, Budget and Legislative Planning and Statistics. Other department heads include the Chiefs of the Combat Arms, Services and Bureaus, Corps Area and Department Commanders, the GHQ Airforce, the Superintendent of the Military Academy, and Commanders of activities not otherwise assigned.

The Combat Arms include the Infantry, Cavalry, and Field Artillery. The Supply Arms and Services include the Air Corps, Signal Corps, Coast Artillery Corps, Corps of Engineers, Quartermaster, Ordnance Department, Medical Department and Chemical Warfare Service. Other departments include the Inspector General, Judge Advocate General, Finance, Chaplains, and the National Guard Bureau.

In a national emergency the War Department General Staff will determine the magnitude of the military program, and the essential items for it, with a time-rate schedule for initial and replacement munition requirements. The Assistant Secretary of War is responsible for procuring these munitions. His supervision ceases when these munitions are available to the Supply Arms and Services for storage, or distribution.

The Assistant Secretary of War directs the Current Procurement Branch, the Planning Branch, the Army Industrial College, and the promotion of rifle practice, and civilian marksmanship. He also supervises War Department claims, real estate, surplus property sales, and the National Cemeteries.

The mission of the Current Procurement Branch is to supervise the procurement of supplies of the designated kind and quality, in the quantity required; and to make them available when needed. It establishes a peacetime system readily convertible into wartime procurement.

The mission of the Planning Branch of the Office of the Assistant Secretary of War is to supervise and co-ordinate the procurement planning activities of the Supply Arms and Services, and to prepare plans for industrial mobilization to support the war procurement program.

The Army Industrial College annually conducts a nine months course, instructing approximately fifty Army, Navy and Marine Officers in military procurement

planning. There are now over 700 graduates of this college. The Army Industrial College also provides a correspondence course for the instruction of Reserve Officers in procurement planning duties.

The War Department Protective Mobilization Plan provides for the mobilization of a million men as its initial military program. Extension to a total force of four such field armies and the necessary GHQ reserve and harbor defense is possible. Planning for industrial mobilization is a long range proposition, and must be based on the total ultimate force. The present plan is flexible, and adaptable to many possibilities of mobilization, balancing with the industrial production capabilities of the country.

The Army and Navy Munitions Board is the official peacetime and wartime agency for co-ordinating procurement of Army and Navy Munitions. It is one of the most vital agencies in the mobilization program, keeping the warload program up to date and wisely distributed. The Board recognizes the requirements of both the Army and Navy and insures consideration of their needs in all plans. Studies are continuously in progress wherever these services are competitive as in the production of airplane bombs, powder and explosives, wire and cable, and machine tools. Aeronautical, automotive and precision instrument manufacturers are among the key industries already allocated to the Army or the Navy.

The War Department is keeping abreast of World developments in military munitions and tactics. There is continuous experiment and research to devise munitions embodying the latest engineering and scientific developments. Munitions should be of simple and practical design, suitable for quantity production in commercial plants. The War Department does not attempt to acquire a large quantity of weapons which may soon become obsolete, but it must provide the Army with sufficient modern weapons for training, and emergencies. When new weapons are developed and accepted, the War Department makes plans for their production in the quantities required. On Mobilization Day, production would start immediately on the best military equipment developed up to that time.

Private Industry's Place

In any major emergency the War Department must depend on private industry for at least 90 per cent. of its munitions requirements. War Department representatives have surveyed more than 20,000 industrial plants, approximately half of which have been designated for wartime production. Our government arsenals are vital for preparedness, but they find their true role as experimental and testing laboratories, setting standards, training inspectors, and keeping alive the art of munitions making.

Each supply service has divided the country into procurement districts, the boundaries of which have been set to meet its particular needs for procurement planning in peace and decentralized procurement in war. The number of supply districts is as follows:

QMC 9	Corps of Engrs. 6
Ordnance 14	Medical Dept. .. 4
Air Corps 10	Signal Corps ... 3
CWS 5	

The district chief is usually a prominent local business leader, with a regular officer of the branch concerned as executive assistant, with one stenographer-clerk. This district organization not only makes industrial surveys but it is the nucleus for expansion in case of war. Surveys are continuing functions, as neither resources nor requirements can remain fixed. Continued studies disclose bottle necks, changing industrial conditions, and improvements in materials, processes and methods.

Each Supply Arm or Service computes its needs under the General Staff Mobilization Plans, apportioning these requirements to their several districts. The Supply Arm or Service having the major requirement of any important item is usually given the responsibility for its procurement for the Army as a whole.

The warload is as evenly distributed about the country as is practical to afford maximum production, consistent with strategic and economic considerations, industrial congestion and civilian needs. A uniform method of reporting the war load placed upon facilities is now expressed as a percentage of the ultimate capacity as a whole, as well as for the munitions items, providing an accurate picture of the war load showing available capacity for unforeseen demands.

Production Apportioned

After determining that industry can produce the required items, this capacity can be equitably apportioned among the procuring agencies, including the Navy. Plans for expansion, or new construction are provided when required. The procedure of apportioning manufacturing capacity among the procuring agencies is termed "allocation." Most commercial materials can be procured by competitive bidding, which is desirable. Allocation is essentially for certain technical items, for which there are no commercial counterparts, such as artillery, military aircraft, ammunition, bombs, fire control instruments and gas masks.

After approval of a plant allocation a production schedule is agreed upon with its management. This is not legally binding, but it indicates the willingness and ability of the firm to produce the items at the rate prescribed. This production schedule includes the number and kind of employees, financial rating, normal products and production capacity. The plant familiarizes itself with the items to be manufactured through specifications, and drawings and actual samples when appropriate. Many plants, on their own initiative, have taken preliminary steps incident to production, thereby saving months of vital time in meeting requirements.

The Chemical Warfare Service prepares plans for the wartime procurement of all Chemical Warfare Service material required by the War Department. It is responsible for specifications, plant surveys and the apportioning of its requirements to industry. It requires miscellaneous chemicals; fine and heavy, organic and inorganic, raw, intermediate and finished. It also requires such miscellaneous items as masks, filters, lenses, alarms, protective materials, textiles, rubber parts, tank cars, ton drums, dies and tools. Chemical Warfare Service District Procurement Officers are located in Boston, New York City, Pittsburgh, Chicago, and San Francisco. Each officer is responsible for keeping up to date the surveys of chemical industries in that district.

Chemical Warfare Specification

Approximately 700 Chemical Warfare Service specifications are required. About 80 per cent. of these have been approved, and adopted, and cleared through industry. Over 300 Chemical Warfare Service plant allocations have been approved. Production schedules on more than 200 Chemical Warfare Service items have been signed and accepted by industry.

The chemicals required in the manufacture of such munitions as explosives, steel, textiles, and pharmaceuticals for the Ordnance, Quartermaster and Medical Departments are procured independently of the Chemical Warfare Service. However, detailed information on the chemical industry is centralized at Washington, D. C. in the office of the Chief, Chemical Warfare Service, and in the Army and Navy Munitions Board.

During the World War our military forces requisitioned over 600,000 different items. Through standardization, the number of items has been so reduced that at present our Army needs but 70,000 different items, most of which are available in the open market. However, several thousand of these items would impose a severe burden on industry during a war, requiring special production facilities. There are also over a thousand items for which there is no commercial demand or counterpart.

Most essential items can be in production in six months or less, but there are more than fifty critical articles needed by the Army which could not be in production for a much longer period. Congress has appropriated funds for educational orders to enable the War Department to place small orders with industry for some of these non-commercial articles, to prepare them in peacetime for wartime pro-

duction. These funds provide necessary dies, jigs and fixtures which remain the property of the government for use when needed, thereby shortening the time necessary for quantity production.

During the World War there were six independent and unco-ordinated Army Supply Services bidding competitively for their needs. There were over 400 different contract forms and much confusion and litigation resulted. The War Department has now consolidated all War contracts into six comparatively simple forms covering all purchase contracts for construction and supplies. These forms, adopted with the advice of industry are workable, and suitable for prompt production. Fixed price contracts are utilized as far as practical. Contracts may include a reasonable profit incentive and protection against unreasonable risks. Industry can expect relative freedom from postwar persecution for acts of good faith, technically incorrect, committed in haste under war pressure.

No other nation can match the ample resources of our full requirements of food, coal, petroleum, power, iron ore, iron, steel, machinery, chemicals, copper, lead, zinc, silver, cotton, nitrates and phosphates. However, our domestic production is dependent upon foreign sources for certain raw materials from which we may be cut off in wartime by a blockade or an embargo. These problem items include aluminum, antimony, chromium, manganese, mercury, mica, nickel, tin, tungsten, hides, jute, manila fibre, silk, siscel, wool, coffee, iodine, opium, quinine, cocoanut shells, optical glass, and rubber. Congress has recently authorized the Army and Navy Munitions Board to purchase and store in this country an emergency war reserve of certain of these strategic items.

The 1939 Industrial Mobilization Plan provides for the possible creation by the President of the War Resources Administration, a civilian agency, to execute his powers for the mobilization of industry. The Army and Navy Munitions Board has made exhaustive studies of World War problems of raw materials (including food), transportation, industrial facilities, labor, capital, power and fuel, publicity, price control and financing of procurement. War Department plans provide for essential wartime control and co-ordination of these problems. The organization of the Army and Navy Munitions Board in general parallels that of the War Resources Administration, and its records, plans and personnel would form a nucleus for this super-agency if it is brought into being. After the War Resources Administration begins functioning, the Army and Navy Munitions Board will become the liaison between it and the military services.

The War Resources Administration would, if necessary, control finances, prices, trade, priorities, clearances, conservation, power, fuel, transportation, labor and industry. Although it is essential that this power be available in Wartime, it does not necessarily follow that all these controls be imposed.

Bernard Baruch has proposed the following price control formula: "Unless later adjusted by the President upward, no price shall rise above the price at which it stood on a certain day." He suggests that Congress or the President designate that "certain day."

The War Department believes that procurement planning, if comprehensively developed will in itself largely prevent war profiteering, accomplishing this through fair contracts, and the elimination of competition among the government services for industrial products. The War Department supports the industrial provisions for war control measures, but urges the elimination of tax measures that restrict or destroy production of munitions in the time and quantity required.

Industrial mobilization is insurance against war, but if war is inevitable our military forces will be adequately equipped. It should deter any military ambitions an enemy might have against us. It provides for an orderly conversion and expansion of industry for munitions production, with reasonable control and help in the solution of its problems involving labor, raw materials and contributing items and services It provides reasonable hours and wages for labor based on costs of living and wartime needs with equitable adjustment of differences between capital and labor.

War Department, Government, business and industrial leaders do not want war, but all agree that, in these critical times, adequate preparedness is essential. Our military and industrial leaders are constructively co-operating on a comprehensive program for national defense. Through such continued co-operation our country can successfully meet any wartime emergency.

Practical Alum Test

In paper mills there are three important uses of aluminum sulfate: (1) To assist sizing and formation; (2) To neutralize carbonate; (3) To control pH.

In mills where there is a large amount of carbonate present, either from the use of shavings or from high carbonate water, or where sulfuric acid is used, the pH index fails to give even an approximate estimate of the aluminum sulfate concentration. When this condition prevails, practical difficulties often are encountered. The quality of the sheet is tied up directly with the aluminum sulfate concentration in the vat; and control of aluminum sulfate is necessary for uniform quality.

There is no quick, easy and reliable control test for aluminum sulfate in general use in paper mills. However, there is a colorimetric test which is ideally suited for paper mill control of alum concentration. This test is about as easy to run as a pH test, takes about as much time and does not require unusual equipment or reagents. The complete procedure is given in the *Paper Industry and Paper World*, Jan., '40, p, 1083.

Method of Analysis

The presence of impurities in the amount of 0.01% or less can now be detected by subjecting a sample to a test recently perfected by the National Bureau of Standards. The test is accomplished by freezing the specimen under examination and then comparing its freezing range with that of a similar specimen, frozen under identical conditions, to which a small known concentration of another substance has been added. An absolutely pure substance is characterized by the fact that it always melts or freezes at precisely the same temperature. When an impure substance freezes the temperature usually decreases over a freezing range. The Bureau states that they have developed a procedure by which the magnitude of the freezing range can be used as an accurate yardstick for measuring extent of impurities.

A publication will soon be issued by the Bureau discussing in detail the apparatus and methods developed for this test.

New Use for Plastics

"Plastacelle" cellulose acetate plastic has just been introduced in a new line of shelf-edging. This edging is long-wearing, decorative, and truly easy to keep clean and fresh, for the wiping of a damp cloth across its slick surface will remove dust and dirt. This practicality comes with no sacrifice to daintiness, for pastel colors and delicate designs, as well as deeper hues and bolder patterns, are to be had. The designs are painted on the back of the clear, transparent plastic. In this way, the painted patterns are protected from wear and washing.

Five designs in a range of ten colors, intended especially for linen closet use, include forget-me-nots and other florals, a hat box and coat hanger pattern, and conventional border motifs. The edging may be fastened either with tacks or with the usual type of double-faced adhesive tape.

Technical Oleyl Alcohol

A new purified type of technical oleyl alcohol, called "Ocenol" KD, which is water white and has a bland odor has recently been made available. Because of its good odor and color characteristics, this product is said to be admirably suited to the cosmetic trade. "Ocenol" markedly reduces the surface tension of oils, and, therefore, promotes the stability of oil and wax emulsions. It also promotes limpid solutions of oil.

Milestones Of Progress

in

AMERICAN PATENTS

By E. L. Luaces*

THE United States Patent Office is this year celebrating the Sesquicentennial of the American Patent System. The President of the United States, by Executive Proclamation, set aside April tenth as Patents and Inventors Day, for it was on April 10, 1790, that George Washington affixed his signature to the bill which has been the cornerstone of the American Patent System as we know it today.

For one hundred and fifty years our Patent System has encouraged and brought reward to the genius of inventors. It has protected and offered them the opportunity of profit from their labors, and at the same time has promoted innumerable applications of the arts and sciences to the needs and well-being of the peoples of the world. Industry has flourished under it. New products have been invented and old ones put to new uses. Employment has been given to untold millions, and it has nurtured the genius of Westinghouse, Edison, Goodyear, Hall, Acheson, Baekeland, Ellis, and countless others who have contributed so much to the progress of mankind.

The development of the American Patent System makes an interesting story. Before the Constitution of the United States was adopted, many of the Colonies granted patents. The first patent was granted to Samuel Winslow in 1641 by the Massachusetts General Court for a novel method of making salt. Thus the first patent granted was for a chemical process.

Colonial patents were issued only by special acts of the legislature. There existed no general laws providing for the granting of such limited protection or monopolies. When the delegates assembled in Philadelphia in 1787 to frame the Constitution, one of the problems before them was to devise means for giving protection to inventors and authors.

The delegates assembled in Philadelphia on May 14, 1787, and on August 18 both James Madison of Virginia and Charles Pinckney of South Carolina, submitted proposals for the protection of inventors by means of patents. On September 5, the Constitutional Convention adopted the clause related to patents and copyrights. On the 17th the Constitution was signed by the delegates, and it included Article 1, Section 8, which said in part:

> *Congress shall have power . . . to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and inventions.*

On March 4, 1789, the Constitution became effective, and on January 8 of the following year President Washington addressed the First Congress and urged the members to give "effectual encouragement . . . to the exertion of skill and genius at home." A week later a committee consisting of Ædanus Burke of South Carolina, Benjamin Huntington ot Connecticut, and Lambert Cadwalader of New Jersey, was instructed to bring separate bills on patents and copyrights. On February 16 the patent bill was presented, and after debate was passed by the Senate and the House of Representatives and signed by President Washington on April 10, 1790, in Philadelphia.

The intrinsic rights of an inventor to the product of his genius first received legal recognition in the United States under the provisions of that law. It placed responsibility for granting patents upon a board consisting of the Secretaries of State and War and the Attorney General. Administrative responsibility was given to the State Department, and thus Thomas Jefferson, an opponent of monopolies, was the first administrator. He was later to state:

> *The issue of patents for new discoveries has given a spring to invention beyond my conception.*

With the passing of time the Patent System underwent many changes, some minor and others fundamental. It would require too much space to relate the circumstances surrounding each, but each was a Milestone of Progress. The most important ones will be set forth briefly and in chronological order, together with some outstanding patents and interesting facts.

1790 The first United States Patent was granted to Samuel Hopkins of Vermont for a method of *Making Pot and Pearl Ashes.* Thus the first Federal patent, like the first Colonial patent, was for a chemical process. A total of *three* patents was issued that year.

At fashion show held in conjunction with banquet celebrating 150th anniversary of U. S. Patent System, models were dressed in gowns representing great industries. This young lady represented chemical trade.

1793 By the Act of February 21 the patent laws were substantially changed. Many complaints had been made about delays in examination of applications, for it seems that Jefferson was personally examining each for novelty and usefulness. The original requirement that an invention be "sufficient useful and important" was dropped, and thus the *examination* system was replaced by the *registration* system. The duty of granting patents was placed solely on the Secretary of State. Aliens were forbidden to obtain patents. Interferences were to be decided by a Board consisting of one man appointed by the Secretary of State, and one by each of the parties to the interferences. The Board's decision was final.

1800 Aliens were given the right to obtain patents if residents for two years and if they had declared their intention of becoming citizens.

1802 Secretary of State James Madison gave the Patent Office the status of a separate unit within the Department of State by appointing Dr. William Thornton "to have charge of the issuing of patents" at a salary of $1,400 a year. He served for 26 years.

1836 Samuel Colt of Connecticut received a patent for a *Revolving Gun.* Senator Ruggles of Maine reported to Congress that "Many patents granted are worthless and void. . . . Frauds develop. People copy existing patents, make slight changes, and are granted patents. . . . Patents have become of little value, and the object of the patent laws is in great measure defeated." As a result vital

* Box 1107, Woodhaven, N. Y.

changes were made in the law by the Act of February 4. The *examination* of applications was reinstated. The post of Commissioner of Patents was established, with salary of $3,000 per year. Application fees were $30 for citizens, $500 for British subjects, $300 for all other aliens. Consecutive numbering of patents was begun. Patent No. 1 was issued to John Ruggles, Senator from Maine, through whose efforts the patent laws had been greatly improved. It covered a *Locomotive Steam-Engine for Rail and Other Roads* designed to give "multiple tractive power to the locomotive and to prevent the evil of the sliding of the wheels." The Patent Office was destroyed by fire with an estimated loss of 7,000 models, 9,000 drawings, and 230 books, together with all records of applications and grants.

1840 Samuel F. Morse of New York received patent No. 1,647 for *Telegraph Signs.* This is the telegraph that today circles the globe.

1842 Design patents were authorized, to run for a period of seven years. Commissioner of Patents Ellsworth stated in his annual report that "the advancement of the arts, from year to year, taxes our credulity and seems to presage the arrival of that period when human improvement must end."* Charles Goodyear of New York received Patent No. 3,633 for an *Improvement in the Manner of Preparing Fabrics of Caoutchouc or India-Rubber.* This was the vulcanization of rubber.

1849 The Act of March 3 transferred the Patent Office to the Department of the Interior. Abraham Lincoln, Representative from Illinois, received Patent No. 6,469 for *A Device for Buoying Vessels over Shoals.* Lincoln whittled the model with his own hands, and it is preserved in the Smithsonian Institution in Washington. It was Lincoln who later said:

> *The Patent System added the fuel of interest to the fire of genius.*

1859 Copyright matters were transferred from the State Department to the Department of the Interior and assigned to the Commissioner of Patents for attention.

1861 The Act of March 2 increased the term of patents from 14 to 17 years, and the Commissioner of Patents lost his right to extend patents. A Board of Appeals was established. Design patents for terms of 3½, 7 or 14 years were provided for. Fees were equalized for citizens and aliens alike.

1869 Commissioner Sparks introduced the merit system for selecting appointees to the technical staff of the Patent Office. Publication of Commissioner's Decisions was begun.

1870 The Act of July 8 consolidated 25 acts and parts of acts previously passed and included several new provisions. John W. Hyatt, Jr., of New York, received Patent No. 105,338 for *Improvement in Treating and Molding Pyroxyline.* This was the beginning of the celluloid industry.

1871 Congress ordered the discontinuance of the Patent Office Reports and directed the Commissioner of Patents to print copies of patents for free distribution to libraries and for sale to the public. Searches were thus greatly facilitated.

1872 The Official Gazette of the United States Patent Office was first issued, and it has continued to be issued to this day.

1873 Louis Pasteur of France received Patent No. 135,345 for *Improvements in the Process of Making Beer* and Patent No. 141,072 for *Improvements in the Manufacture and Preservation of Beer and in the Treatment of Yeast and Wort, Together with Apparatus for the Same.* These patents involve some of Pasteur's fundamental discoveries. The Appropriation Act of this year provides that two positions of assistant examiners may be held by women, and Anna R. G. Nichols of Massachusetts became the first examiner.† Samuel L. Clemens (Mark Twain) received Patent No. 121,992 for *An Improvement in Adjustable and Detachable Straps for Garments.* Mark Twain wrote:

> *A country without a patent office and good patent laws is just a crab and can't travel anyway but sideways and backwards.*

1874 The Patent Office was given charge of the registration of copyrights for prints and labels for articles of manufacture.

1876 Alexander Graham Bell received Patent No. 174,465 on *Telegraphy*, which today is known as the telephone.

1880 Thomas A. Edison received Patent No. 223,898, for *An Electric Lamp for Giving Light by Incandescence.*

1881 The Act of March 3 provided for the registration by the Patent Office of trademarks used in commerce with foreign nations and with the Indian tribes, but made no provision for the registration of marks used in interstate commerce.

1886 The United States became a member of the International Convention for the Protection of Industrial Property formed in Paris in 1883. The most memorable hearing in the Patent Office took place in the matter of *McDonough v. Gray v. Bell v. Edison*, an interference to determine the inventor of the telephone. Bell's claims were upheld.

1896 Edward G. Acheson of Pennsylvania received Patent No. 560,291 for an *Electrical Furnace*, which has made possible the production of artificial abrasives far superior to natural ones and widely used in industrial operations.

1905 The Act of February 20 authorized the registration of trade-marks used in interstate commerce.¶

1909 Leo H. Baekeland of New York received Patent No. 942,809 for *New and Useful Improvements in Condensation Products and Method of Making Same.* Bakelite was born, and with it the immense plastics industry.

1911 Patent No. 1,000,000 was issued.

1922 The Commissioner of Patents, by the Act of February 18, was given the power to require patent agents and patent attorneys to have certain qualifications before being admitted to practice before the Patent Office.

1925 The Patent Office was transferred to the Department of Commerce by Executive Order.

1929 Appeals from the Commissioner of Patents were transferred to the Court of Customs and Patent Appeals.

1930 The Act of May 23 provided for the patenting of plants "asexually reproduced."

1931 Plant Patent No. 1 was issued to Henry F. Bosenberg of New Jersey for a *Climbing Rose* "characterized by its everblooming habit."

1939 Registration of copyrights for prints and labels was transferred from the Patent Office to the Library of Congress, to become effective July 1, 1940, thus ending the Patent Office's connection with copyright matters. Five bills (H.R. 6872, 6873, 6874, 6875, 6878) modifying certain provisions of the patent laws were enacted into law.

1940 Up to January 1 the Patent Office had issued 2,185,169 consecutively numbered patents (and 9,957 unnumbered granted before 1836); 118,357 design patents; and 351 plant patents: and had registered 374,061 trade-marks; 54,094 labels; and 17,780 prints.

It would thus seem that the American Patent System has accomplished everything that was expected of it and more. It has served as a model for patent systems based upon *examination* used in other countries. It is a democratic system. It offers the same protection, opportunity, and hope of reward to the small company or individual as to the large corporations. It has for a hundred and fifty years served as recognizance of the inventor's inherent right to the government's protection. There might have been occasional abuses of the patent grant, but the administration of the patent laws has always been free from scandal and above reproach.

The data incorporated in this article have been obtained from publications of the United States Patent Office and the Department of Commerce, and due acknowledge is made to the Secretary of Commerce and the Commissioner of Patents.

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* More than 2,000,000 patents have been granted since then!

† There are now 14 women examiners.

¶ Since then over a third of a million have been registered.

"Headliners" In the News

General Conference Committee, National Industrial Advertisers' Association, formulates plans for convention being held in Detroit, September 18-20. Left to right, seated: Ralph L. Wolfe and T. B. Moule, Seiler Wolfe and Associates; Lloyd R. Vivian, Ditzler Color Co., Chairman; Henry G. Doering, The Truscon Laboratories; E. C. Howell, Carboloy Co. Standing: Philip Linne, Owens-Corning Fiberglass Corp.; Charles M. Gray, Chas. M. Gray & Associates; William J. Chappell, The Timken-Detroit Axle Co., A. F. Denham, Denham & Co.

Charles W. Hess, president, C. W. Hess Co., who was recently appointed Michigan representative for Stroock & Wittenberg Corp., to handle its line of S&W Synthetic Resins, Ester and Natural Gums.

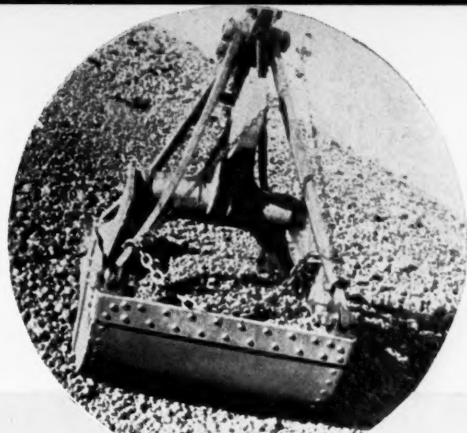
R. L. Parish, president, American Flange & Manufacturing Co., was elected Master of Fox Hounds by the Board of Directors of Goldens Bridge Hounds, 30 Rockefeller Plaza, New York, a hunting group which rides over various fields in the East. Kennels are at Rock Ridge Farm, Brewster, N. Y.

Above—A. C. S. $1,000 Prize in Pure Chemistry has been awarded for '40 to Dr. Lawrence Olin Brockway, (top) assistant professor of chemistry at Michigan. Francis P. Garvan Gold Medal to honor American woman for distinguished service in chemistry goes to Dr. Mary E. Pennington (circle) authority on refrigeration of perishable goods.

Below—Most Rev. Alexander Vachon, recently elevated to Coadjutor, Archbishop of Ottawa (holding staff) is noted as professor of chemistry, organizer of research, active in professional and industrial chemical societies and past-president of the Canadian Chemical Association. Photograph, taken in Archbishop's Palace, Ottawa, immediately after his consecration, includes: left to right, front row: Most. Rev. Hildebrand Antoniutti, Apostolic Delegate to Canada and Newfoundland; His Eminence, Rodrigue, Cardinal Villeneuve, Archbishop of Quebec; Rt. Rev. Joseph Charbonneau, Bishop of Hearst, (wearing white mitre); Archbishop Vachon, and Lieut. Col. the Rt. Rev. L. Nelligan, head, R. C. Chaplain Service of Canada and Bishop of Pembroke.

Nearby Manganese

SUPPLIES of No. 1 strategic mineral—manganese—is gift of Freeport Sulphur Company to Uncle Sam. Through its subsidiary, Cuban-



Below—Quinto Pit, principal ore body now being mined by Cuban-American Manganese Corp. Dragline is stripping over-burden to uncover the raw ore. Inset (left) shows processed ore.

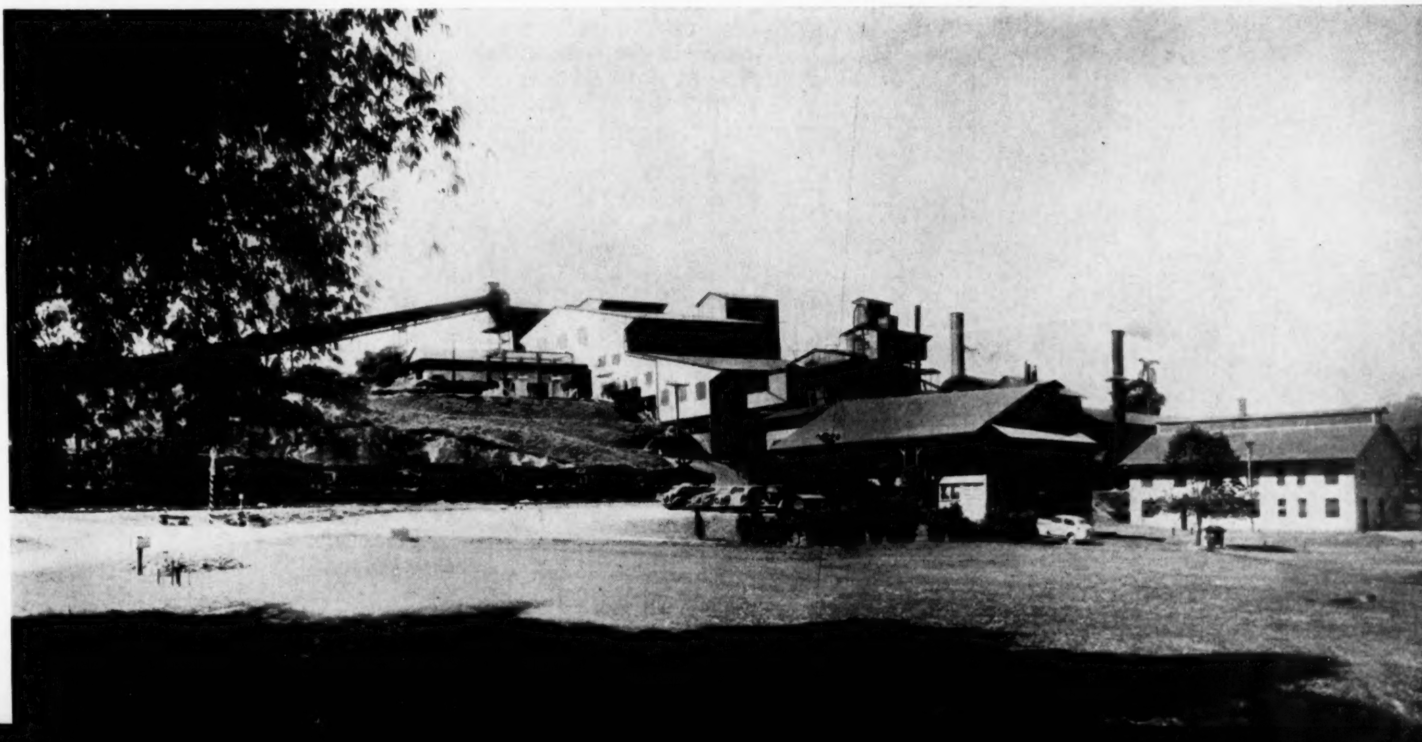
American Manganese Corporation, it has been developing manganese deposits of Cuba, centering operations at Cristo.

In order to concentrate Cuban ores to steel industry quality, an entirely new process was developed by the company, entire operation of which is shown and described on this and following page.

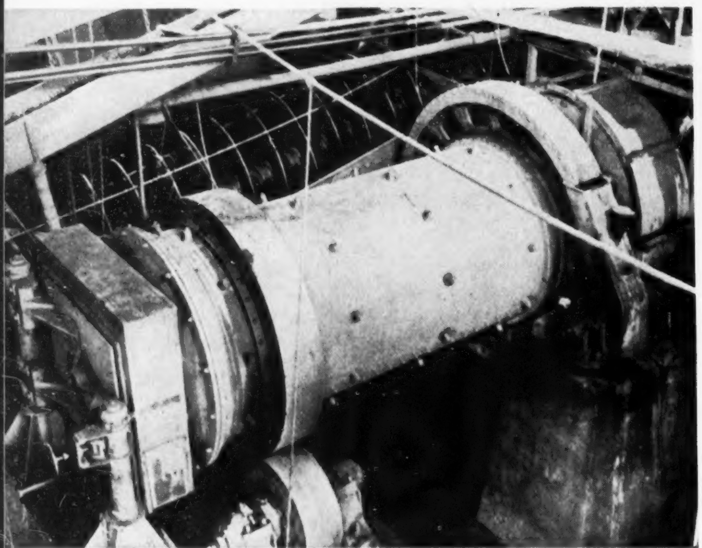
Raw Cuban ore is largely 13 to 26 per cent. manganese, contrasted with the 50 per cent. content required for manufacture of ferromanganese used in steel making. Cuban-American began construction of a plant to attempt the necessary concentration in '31, finished it in '32. Later additions completed the plant pictured below.

Early technical and metallurgical difficulties were complicated by a depressing series of natural disasters. Three major floods, each greater than any in 20 years before operations began, a major earthquake, and a revolution each took their toll. Then in '35, an economic setback was encountered when the protective U. S. tariff on manganese was cut, making Cuban operations uneconomical at costs then prevailing. This caused a shutdown of approximately a year while new improvements to reduce operating costs were worked out.

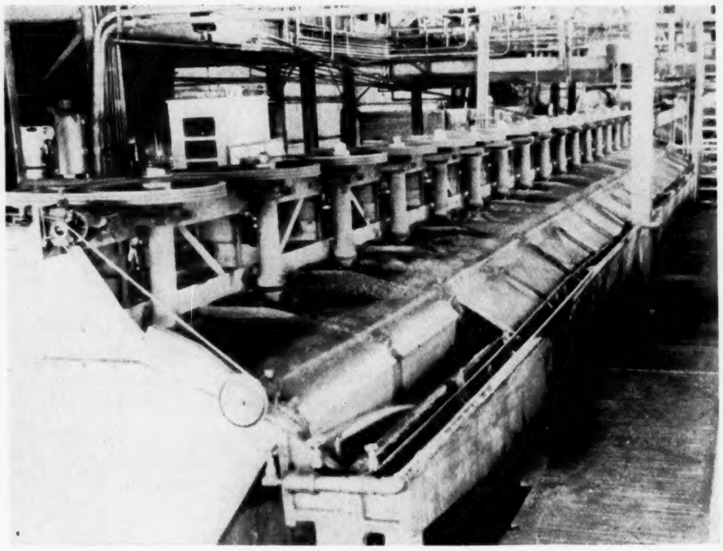
But progress has been steady despite hardships. In '31, less than 1 per cent. of U. S. manganese imports



Raw ore is first ground to "unlock" manganese from gangue or waste material. Crusher breaks it into lumps 4" or less in size, then it is carried by belt conveyor shown at right, to cylindrical steel storage bins.



Before "flotation" by which manganese is separated from gangue, ore is ground to powder fineness in rod mills like this.



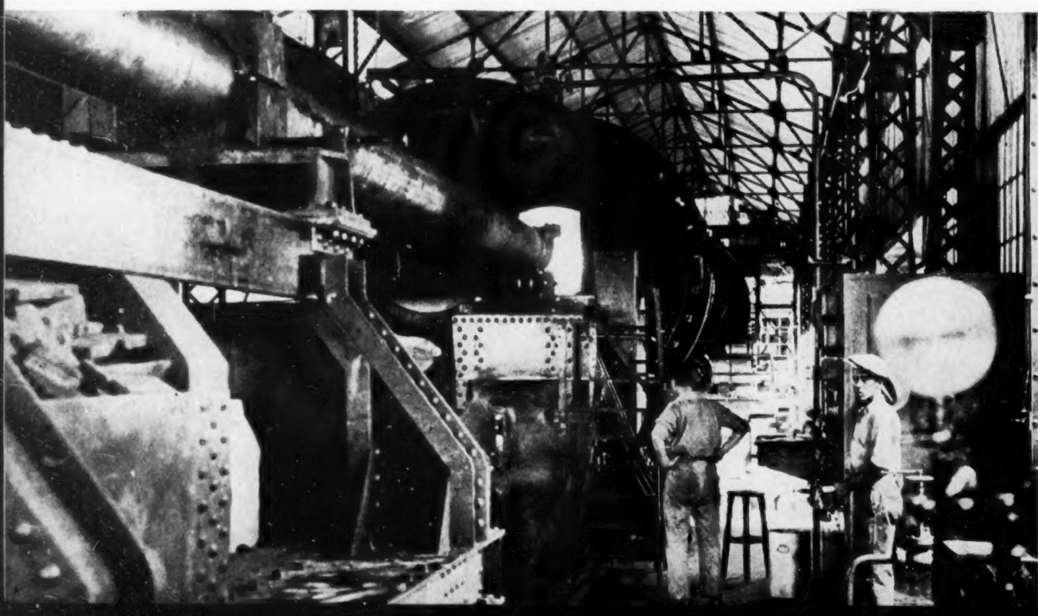
In cells, the finely-ground ore is subjected to a "rougher flotation" followed by a "cleaning" in other cells to improve grade.

came from Cuba. By '38, Cuban imports increased to approximately one-fourth of U. S. total.

It is felt that this development has greater significance than assuring the United States a nearby source of high-grade manganese for national defense requirements. Many U. S. deposits are of similar grade, and Cuban-American's process holds promise of possible application to domestic ores.

Manganese—often called the "starch of steel"—goes into the steel-making process at the rate of 14 lbs. to each ton of steel produced. Before Cuban production started, the United States was dependent upon Russia, India, Africa, and Brazil for the major portion of its manganese ore. Even today, some supplies are imported from these sources.

During the "first" World War, a grave emergency was created when imports from distant sources were crippled. Then, domestic producers, starting from scratch, succeeded in producing a peak of 35 per cent. of U. S. requirements. This production figure was attained in '18, but with the close of the war, production—no longer profitable—declined, with the result that more than nine-tenths of subsequent U. S. supply was again imported.



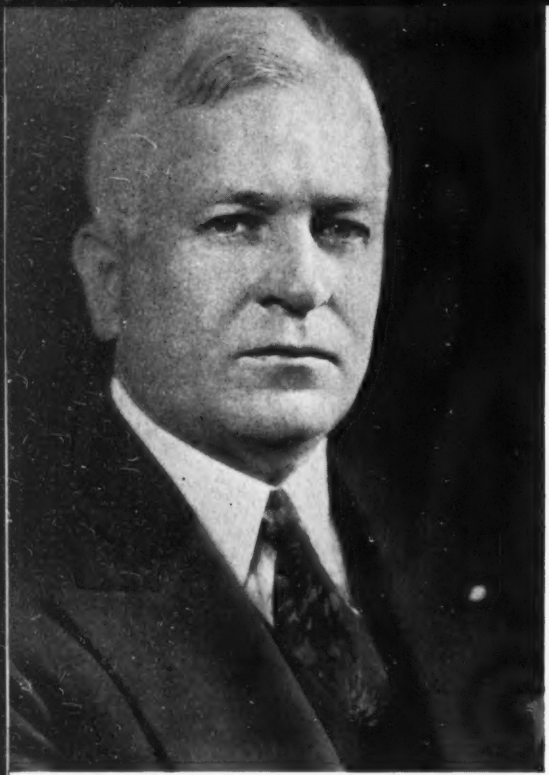
In flotation process, an oily emulsion coats the surface of each particle of manganese with a thin film. The reagent will not coat particles of waste material. Because of this film, the manganese particles become attached to air bubbles, which lift the mineral, although heavier than the waste, to the surface of cells. Here it is removed, completing the separation from waste.

PLANT OPERATION AND MANAGEMENT

New Alloy Developed by Westinghouse

P. H. Brace (right), Westinghouse Research Metallurgist, and P. G. Vetty, examine curves plotted from results of creep tests on K-42-B, new alloy developed by Mr. Brace after 7 years of research. It is said to be stronger than any known steel containing only 7 per cent. iron, yet retaining its strength at temperatures higher than 2000° F. Tests have shown new alloy stronger at 1100° F. than ordinary low carbon steel is at room temperature.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS



Management's Role In Plant Safety

By

H. L. MINER

Manager, Safety and Fire Protection Division
E. I. du Pont de Nemours & Co., Inc.

RECENTLY there appeared in a safety article, an inverse paraphrase of the platitude: "Accidents do not happen, they are caused." The statement was ". . . safety does not happen, it is earned."

That pithy phrase contains a safety truth which we must acknowledge—the fact that establishment and maintenance of a good safety record in industrial plants is fundamentally a co-operatively directed accomplishment of the employes. In other words, it goes beyond the necessary provision of mechanical or physical safeguards: It recognizes the primary factor of employe co-operation and obedience; the performance of the employe, and the democratic direction and control of the human element.

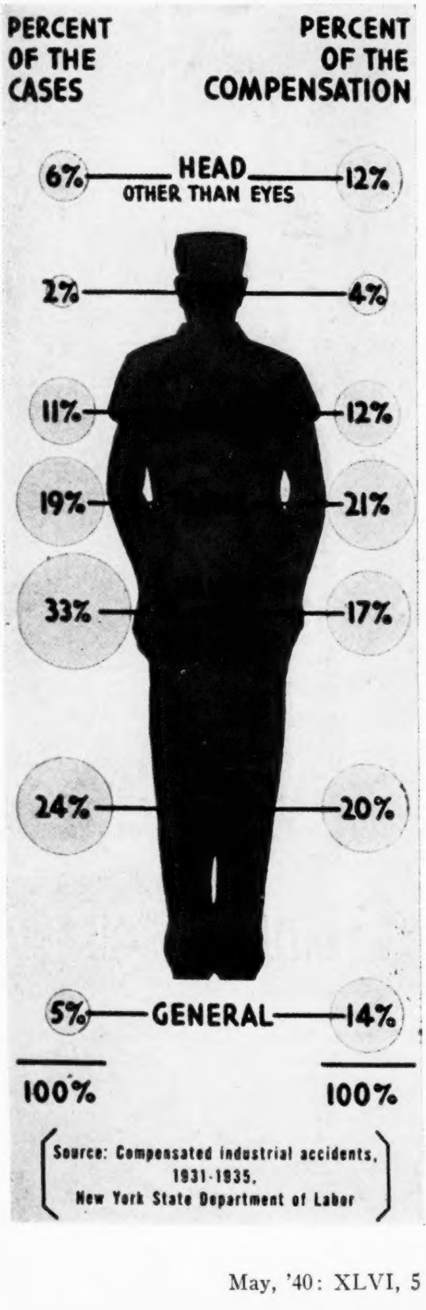
During the past few years the Safety and Fire Protection Division of the Du Pont Company has refrained as much as possible from using the terms "accidents," "accident prevention" and "prevention of accidents." Webster defines an "accident" as "an event which takes place without one's foresight or expectation, an undesigned, sudden and unexpected event." Court Decisions support this definition. Accepting this exposition of meaning it is apparent that many events (personal injuries) which have been classified as "accidents" are not accidents at all for the conditions causing them were not unforeseen and the results not unexpected, unusual or unknown. The fact is that under certain circumstances or a combination of conditions plus the human element, a personal injury is sure to result.

When it is acknowledged that personal injuries are not accidental, not inevitable, nor inescapable, but are, generally speaking, unfortunate experiences or events which could and should have been prevented, our efforts will be more completely effective.

Please understand that in discussing this subject, I am assuming that what is now held to be the first fundamental in the prevention of personal injuries has received full consideration;—namely, that adequate safeguards have been provided including both mechanical and personal equipment. The second fundamental of the personal injury problem, which is the subject of our discussion, is equally if not more important, namely, "employes must understand that they are required to work safely, must be taught and encouraged to do so, and that supervision must see that they do so."

A number of years ago an industrial plant which for several years previous had had a very unsatisfactory injury record came under the supervision of the Du Pont Company. During the year preceding this arrangement a total of about eighty tabulatable or time-losing injuries occurred. When supervision, or the plant operating staff, thoroughly understood that it was their responsibility to see that the employes worked safely, major injuries were immediately reduced. Without installing additional mechanical safeguards or changing to any material extent operating rules or safety regulations the following record was established:—Major injuries in January, 5; February, 1; March, zero; April, 1; May, 1; June, 1; nine the first half of the year, then this same plant operated over a year without experiencing a single major injury. After this accomplishment two of what might be called minor, major injuries occurred and then this same plant operated approximately another full year without a serious injury occurring.

What brought about this change? Management and supervision assuming the re-



sponsibility to see that the employes thoroughly understood that they were to work safely, that they knew how to work safely, and that they worked safely.

Is it not obvious that plant operating staffs and supervision have an unusual opportunity to secure the personal safety of employes while they are at work or are on plant or company premises? In fact, the wise executive definitely places this operating responsibility, one of service, upon supervision's shoulders, a responsibility of doing a particularly worthwhile thing and doing it well.

An analysis of the charts and tabulations accompanying this article will furnish a good starting point in the drive toward increased plant safety. They clearly indicate:

1. The part of the body most frequently injured; 2. The causes most likely to result in injuries; and 3. The parts of the body most likely to be injured by certain recognizable injury hazards.

Such an analysis will show that it is the garden variety or commonplace things, the well-known hazards, which are causing most of the suffering and maiming of employes. They are easily recognized, usually easy to eliminate or guard, but seemingly the hardest to prevent recurring, whether they be of the mechanical, physical or the unsafe practice type. Until they have been adequately controlled, eliminated or safeguarded, do not waste time in theorizing, speculating, conjecturing, surmizing and guessing about the unusual thing which may happen. Let's first spend our efforts in accomplishing that which protects the employe to the greatest degree.

Anyone in an executive, staff or appointive position who neglects to do this, is at least morally responsible for personal injuries resulting from conditions which through proper effort and interest could have been corrected.

Another important result from the analysis is that it indicates to supervisors the more important things to be aware of in their supervision of employes from the injury prevention standpoint. I do not mean to convey the impression that all personal injury hazards and unsafe practices should not be studied and cared for. What I intend to convey is: do not postpone concentration on those things and factors which are responsible for the greatest proportion of the injuries.

Lest there be some reader who is still not convinced of the importance of management's role in maintaining plant safety, let us consider several plants of a few hundred to a few thousand employes, which have been well organized for preventing personal injuries, have established enviable records and suddenly began to experience personal injuries.

At Plant No. 1 it was found that the manager was ill and his assistant became over-loaded with work. As a result he was unable to carry on the plant-staff safety committee activities, and supervision deprived of that close contact became lax, lost interest and injuries began to occur. Re-establishment of the plant-staff safety committee activities and a serious type of efficient supervision showed immediate results and the plant in question, employing about 300 workmen, completed a year, 365 days, without a major or time-losing injury.

The next plant, much larger in size, lost employe safety endeavor or what is sometimes called "safety morale" because the plant manager, not realizing the importance of definitely showing his interest in safety, did not attend the central safety committee meetings and his staff likewise became lax. This was felt down the line and injuries cropped up. Likewise in this case, considerable improvement has been made since plant management and supervision have again recognized the importance of accepting their responsibility in regard to employes working safely.

The third instance is a plant employing about a thousand employes. Plant safety work, due to a lack of stimulation and management interest, was being only passively carried on. Consequently, injuries began to occur. Re-establishment of proper management attitude was immediately reflected, and that plant, with nearly 1,000 employes, has gone about a half a year without an injury of serious character occurring.

These instances are presented to show the urgency of management and supervision accepting the problem of preventing personal injuries as one of their plant duties and responsibilities.

It appears to me that supervision's responsibility may be summarized in what might be called "certain essential fundamentals."

The first fundamental which should be stressed in our supervision responsibility scope statement is that supervision must be sure that the employes know how to work safely—educate them to do so. The

Type of Occupational Accident, Part of Body Injured

Type of Accident	TOTAL	Eye	Arm	Hand	Thumb or Finger	Leg	Foot	Toe	Other Parts and General
	Injuries Resulting in Permanent Disability								
All Types	23,027	910	2,456	822	10,706	2,703	1,103	648	3,679
Handling objects	4,862	45	235	190	2,834	533	380	326	319
Falls	3,888	13	1,236	75	513	927	399	20	705
Machinery	5,937	96	276	275	4,475	214	58	106	437
Vehicles	2,094	19	428	37	575	369	83	11	572
Falling objects	1,594	30	76	32	337	366	122	162	469
Using hand tools	1,859	280	53	59	1,011	75	25	12	344
Other types	2,793	427	152	154	961	219	36	11	833
	Injuries Resulting in Temporary Disability								
All Types	142,667	6,598	14,975	12,022	26,965	23,694	10,947	5,874	41,592
Handling objects	39,305	250	2,931	3,187	9,365	2,941	2,630	2,549	15,452
Falls	26,165	43	4,086	748	709	8,746	1,310	152	10,371
Machinery	14,068	330	1,157	1,552	6,847	1,272	685	462	1,763
Vehicles	12,177	40	1,733	481	1,555	2,563	961	501	4,343
Falling objects	14,101	43	1,159	698	1,248	3,382	2,096	1,619	3,856
Using hand tools	12,803	856	1,273	2,149	4,489	1,473	943	345	1,275
Other types	24,048	5,036	2,636	3,207	2,752	3,317	2,322	246	4,532

Source: Reports from five State Labor Departments or Industrial Commissions: Maryland (year ending Oct. 31, 1935), New York, Pennsylvania. Virginia (year ending Dec. 31, 1935), and West Virginia (year ending June 30, 1935). Some details partially estimated.

Types of Occupational Accidents and Nature of Injuries

Type of Accident	TOTAL	Cuts, Lacerations	Bruises, Contusions	Strains and Sprains	Fractures	Burns and Scalds	Amputations	Other
All Types	100.0	26.0	23.6	17.7	17.0	4.6	1.4	9.7
Handling objects	100.0	26.2	18.9	27.9	12.0	0.1	0.7	14.2
Falls	100.0	9.9	23.6	34.5	24.5	0.8	0.1	6.6
To a different level	*100.0*	*8.7*	*24.7*	*30.7*	*29.9*	*0.4*	*0.1*	*5.5*
To the same level	*100.0*	*10.9*	*22.7*	*37.5*	*20.2*	*1.1*	*0.1*	*7.5*
Machinery	100.0	46.6	17.2	2.8	18.6	1.3	9.1	4.4
Elev., hoists and conv.	*100.0*	*22.8*	*28.2*	*6.0*	*35.1*	*0.2*	*3.7*	*4.0*
Engines, power trans.	*100.0*	*39.0*	*21.9*	*4.2*	*19.4*	*1.7*	*9.4*	*4.4*
Power-driven machinery	*100.0*	*51.7*	*14.6*	*2.1*	*15.7*	*1.6*	*9.8*	*4.5*
Other machinery	*100.0*	*52.9*	*14.9*	*2.1*	*11.8*	*1.4*	*13.0*	*3.9*
Vehicles	100.0	18.7	33.9	14.2	27.0	0.4	1.0	4.8
Motor vehicles	*100.0*	*15.6*	*33.4*	*14.5*	*29.8*	*0.8*	*0.8*	*5.1*
Other vehicles	*100.0*	*20.9*	*34.4*	*14.0*	*24.9*	*0.1*	*1.1*	*4.6*
Falling objects	100.0	23.8	41.3	3.7	28.2	0.1	0.6	2.3
Using hand tools	100.0	57.7	21.6	3.0	9.3	0.6	0.7	7.1
Step on, striking object	100.0	40.9	35.1	3.2	5.3	0.3	0.1	15.1
Elect., explosives, heat	100.0	6.0	3.7	0.4	2.5	80.1	0.2	7.1
Harmful substances	100.0	0.9	4.2	0.6	0.1	67.7	0.1	26.4
Other types	100.0	24.8	25.7	9.8	13.1	1.5	0.3	24.8

Source: Reports from four State Labor Departments or Industrial Commissions: Maryland (year ending Oct. 31, 1935), New York, Pennsylvania and Virginia (year ending Dec. 31, 1935).

prevention of personal injuries to employes in industrial plants requires far more than merely installing guards and providing proper personal protective equipment, or providing safe places for them to work.

We have found by actual experience what others are also discovering, that a plant fully guarded and protected from a physical standpoint, while unquestionably much safer than one not so guarded, is not immune to serious injuries or even fatalities. It is the human element with which we must reckon. It is quite possible that a careful, conscientious employe who knows how to work safely would be less likely to be injured in a poorly arranged and unprotected plant than a careless, indifferent, or disobedient employe in a well-guarded and well-protected plant.

The second fundamental embraces a constant, sincere, well-organized effort to gain and maintain the employes' co-operation; that they not only work safely but that they willingly use protective equipment which has been provided, and follow the prescribed operating rules and safety regulations.

Of course, a strict ruling might be established that employes must obey safety regulations to the same extent that they are required to follow operating instructions if they are to retain their jobs. But often the simple operating steps as pointed out by the foreman or supervisor may be easier to understand and follow than the prescribed safety procedure involved in carrying out such steps.

Obviously a moral obligation which must be assumed by supervision is to see that the conditions under which the employes work are safe and properly maintained, that good housekeeping prevails, that all protective equipment is in good repair and functioning as it should and that the employes know how and when to use these safeguards and do so.

To conclude, supervision's duties in safeguarding those in their charge might be summarized as follows:—

1. To see that all employes are properly instructed or educated to work safely—that they understand safety regulations as well as proper operating procedures.

2. The establishment and maintenance of friendly co-operation between the employer and the employes.

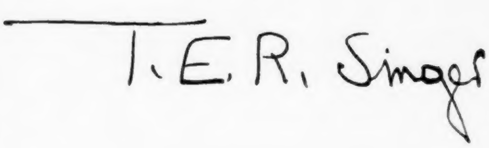
3. That all mechanical safeguards are in place, in good condition, and functioning properly;—that personal protective equipment is available, in good condition and used when necessary.

4. That every employe thoroughly understands that he is to work safely, and to so supervise and direct him that he does so.

5. To be a leader and always set a good example.

Foreign Literature DIGEST

By



G. VAN NEDERVEEN and R. Houwink report on the production of rubber articles from latex, using in a number of cases fillers composed of zinc carbonate, lithopone, etc., and giving many references to other work on the subject, *Chemisch Weekblad*, 37, 122-133 (1940) including French, German, British, Austrian as well as Dutch patents. In the same issue of this journal B. W. Speekman gives a new method of thermal analysis applied in the bromination of phenols. Continuing in the analytical field, W. Th. Nauta, P. J. Wuis and D. Mulder, *Chemisch Weekblad* 37, 96-99 (1940) describe a method for the determination of diarylmethyl radicals. In this journal, once again, 37, 106-112 (1940) E. Starkenstein deals at length with the influence of heavy metals on blood formation, both from the viewpoint of internal consumption and subcutaneous injection of solutions. This article although appearing in a Dutch periodical, is written in German. Apart from the iron compounds, to which a greater part of the article is devoted, copper, magnesium and manganese, etc., are also considered.

I. A. Effront, in *Chimie et industrie*, 43, 3-12 (1940) has an interesting article on the commercial production of bacterial enzymes, and their uses in fields including brewing, bleaching, tanning, etc. Of a very timely nature is C. Berthelot's comprehensive article in the same journal, 43, 91-106 (1940) on war gases and their detection. This includes material on the classification of the gases, such as toxic gases, suffocants, lachrymators, vesicants and sternutators, the properties of the various gases used for these purposes, and of course a large section on the methods of detection and control.

R. DuPont in *Industrie Chimique Belge*, Series 2, Vol. 11, 3-13 (1940), writes on the products obtained by the oxidation of a number of terpenes, and includes a very large number of literature references, and in the same journal, Series 2, Vol. 11, 37-41 (1940) Fédor Goldis describes new molecular filters, and their uses.

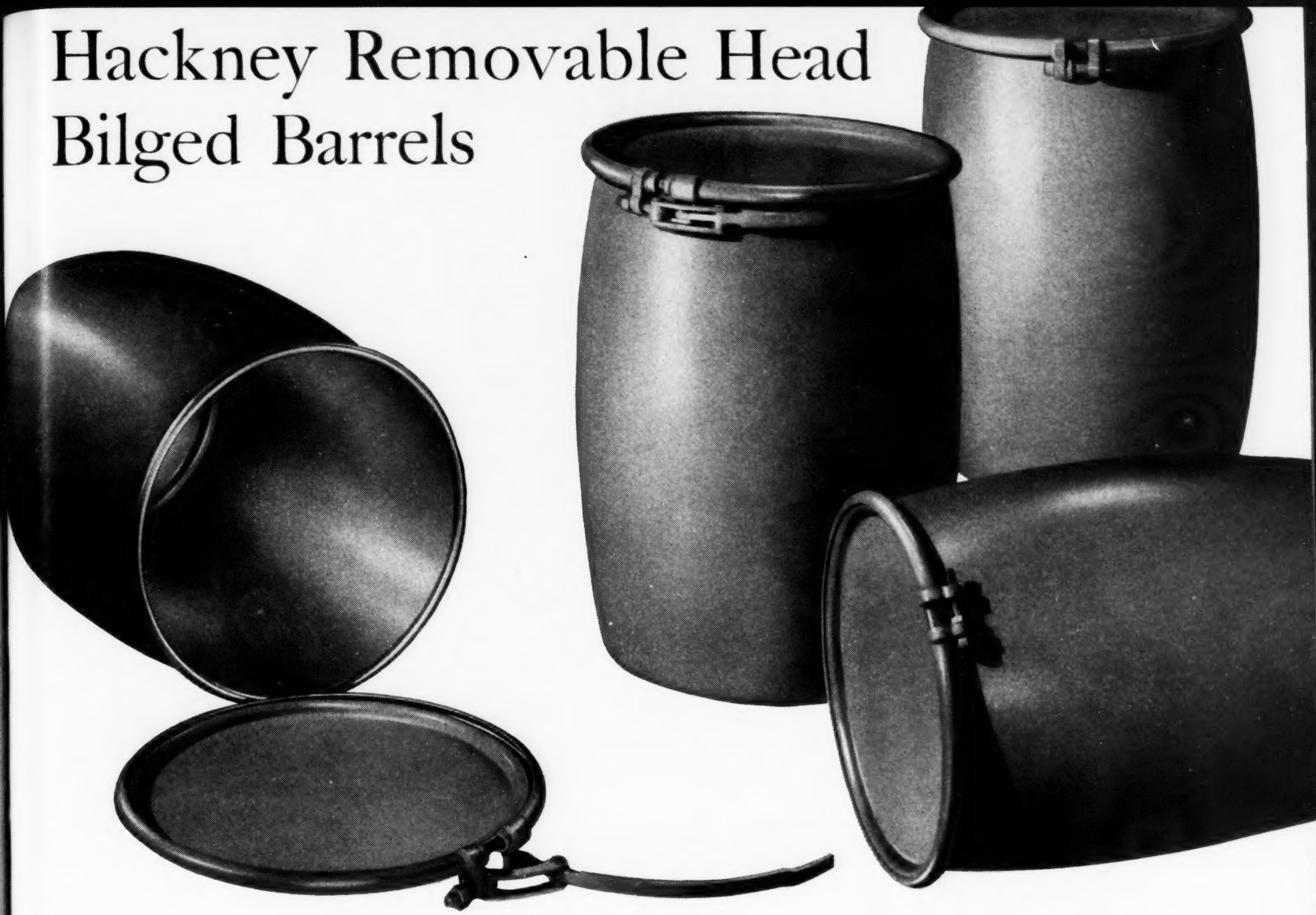
The field of raw materials, and substitutes is investigated by K. Tobias in a survey in *Farben Zeitung*, 45, 86-87, 117-118, 150, and after (1940) on the possibility of using tall oil instead of linseed oil as a binder for printing ink colours, and in the same journal, 45, 101-102 (1940) H. W. Friedrich reports on the effect of the European war on the demand for paint, with particular reference to the use of paint on new buildings. Karl Buser writes in this journal 45, 45-46, and after (1940) on the influnece of the reactive alkyl phenolic resins on fatty oils during the cooking process, with especial reference to fish oils.

New Sulfate Plant

Journal of Chemical Industry (*U. S. S. R.*) *XVI*, No. 12, 1939, p. 50. Y. G. Vasilyev reports on the projected construction of an aluminum sufate plant in Leningrad This compound is the exclusive coagulant used for water purification in Leningrad. The plant has been planned since 1933. Both the process and equipment are described in detail. The aluminum sulfate is made from nepheline concentrates digested with sulfuric acid. Improvements include the presence of a rotatory furnace and a conveyor so made that it is possible to use fire clay if necessary. Other equipment is also arranged for possible work with clay. Crystallization is conducted in bakelite moulds with bakelite lids. The absence of enamel prevents the product's sticking to the walls of the moulds.

P. 45. M. V. Rok of the plant "Red Chemist" reports on a new construction for a pyrites screen developed by himself in 1937. The former screen used in the sulfuric acid industry consisted of a rotating cylinder (or other suitable shape) screen provided with round holes which clogged easily and were difficult to clean. The screen was also rapidly worn out by the pyrites, and had to be replaced every six months. The author used iron in strips instead of plates, so that the slits left between the strips replaced the round holes and the screen could be taken apart in sections when necessary. The assembling of such screens is simpler and less expensive and the screened pyrites is of finer particle size.

Hackney Removable Head Bilged Barrels



. . . assure full protection
. . . provide repeated economies

With Hackney Removable Head Bilged Barrels, you are sure of full protection. There are no cracks or crevices—damage to contents resulting from rust or residue is eliminated.

Enable faster, more thorough cleaning

Smooth, flawless interior enables faster, easier and more thorough cleaning. The Toggle-tite (or single bolt) closure securely holds the head air-tight, to the top edge, preventing leakage or the entrance of foreign matter while in transit, or when the top is removed.

Long life, extra strength built-in

Hackney Removable Head Bilged Barrels constructed by the Hackney process of cold drawing are more resistant to hard knocks and transportation abuse. Their extra long life provides economies which are repeated year after year.

Easy and rapid handling

In the easy and rapid handling of Hackney containers, economies are assured every step of the way—economies that are realized not once, but every time the container is moved.

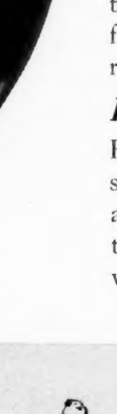
It is vitally important to both shipper and user that the container is *right*. There's a Hackney barrel, drum, tank or cylinder to meet every requirement exactly and economically. Write today for full information.

PRESSED STEEL TANK COMPANY

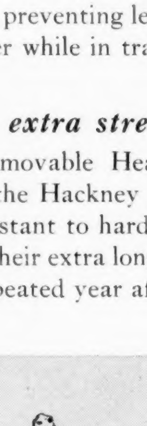
1306 Vanderbilt Concourse Building, New York, N. Y. · 208 S. La Salle St., Rm. 1227, Chicago, Ill. · 699 Roosevelt Building, Los Angeles, Calif. · 1499 S. 66th St., Milwaukee, Wis.

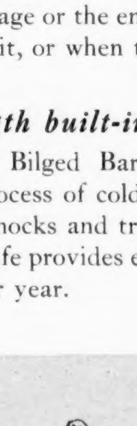
Hackney
MILWAUKEE

Hackney cylinders and tanks are manufactured in a wide range of sizes and shapes to meet practically every requirement.

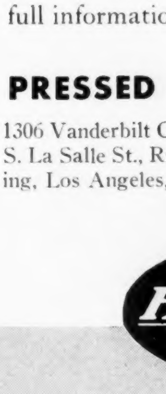


Hackney drums are made in a variety of weights and sizes with I-bar or integral hoops—with or without removable heads.



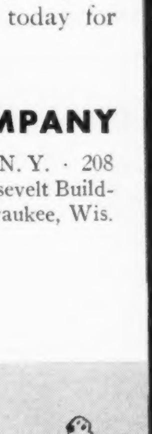


Hackney barrels are made in both seamless and two-piece construction. May be equipped with agitators if desired.



Hackney special shapes and shells are used in many industries—deep drawn from standard or special metals as required.

Cleanability, strength, durability, ease of handling are but a few of the important, money-saving features of Hackney removable head, seamless bilged barrels. Write for full information.



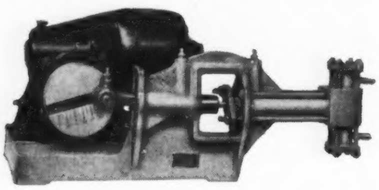
NEW EQUIPMENT

Wrapping Machine QC 72

A new wrapping machine called "Stretchrap" has been designed for wrapping objects or articles of various shapes, using a sheet of "Pliofilm," a new synthetic, moisture-proof, clear crystal sheet. The new machine encases the article in a tightly and smoothly stretched casing, giving protection from dust, air, moisture and handling. The machine can be used for various sizes of articles, for moderate changes in size and shape of the articles no change is necessary. For greater changes in size different holding forms can be supplied. The machine requires one operator and has a capacity of approximately 10 or more per minute. Samples may be submitted to the manufacturer who will "stretchrap" and return them with complete information.

Hypochlorite Pump QC 73

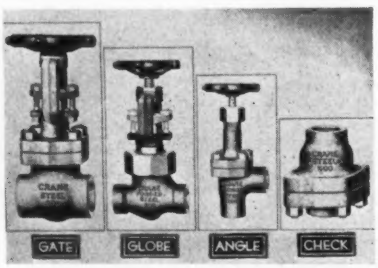
A new pump of interest to chemical and allied industries has been introduced. This pump is designed for capacities from one to ten gallons per hour of hypochlorite or chlorine solution. The capacity is sufficient to provide for chlorination of water supplies from one hundred to one hundred thousand gallons per day. With a maximum pressure limit of 100 lbs., it



will pump against any pressure encountered in the service for which it is built. Special corrosion resisting metals are used to withstand action of solution. The pump is a displacement type and capacity may be readily regulated from five to one hundred per cent. by a simple adjustment of the length of the pumping stroke.

Small Steel Valves QC 74

A newly developed line of small steel valves has been put on the market for steam and oil services. It was felt that, for the service requirements in this field, the common practice of adaptation to, or

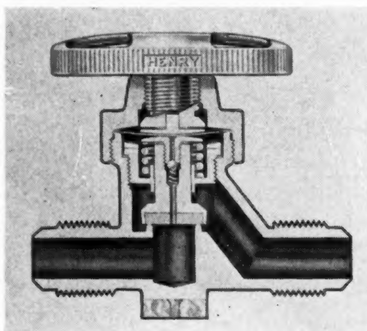


compromise with, existing valve design and construction was not the answer. Something entirely new had to be created; "tailor-made" for their particular applications. Accordingly, each type of valve was given individual attention from start to finish.

This new line includes gates, globes, angles, and checks, in sizes $\frac{1}{4}''$ to $2''$, inclusive and embodies both inside screw and O. S. & Y. construction, union and bolted bonnets, screwed, socket weld, and flanged ends.

Packless Valves QC 75

A new line of diaphragm packless valves is now being offered. It is claimed that these valves with "balancing-action" assure positive valve opening under all pressure conditions. Diaphragm packless valves offer the only hermetic seal for volatile gases and liquids. Their value lies in the fact that they have no stem packing and consequently this source of leaks is eliminated. In some cases, with diaphragm pumps, when the differential in pressures above and below the seat



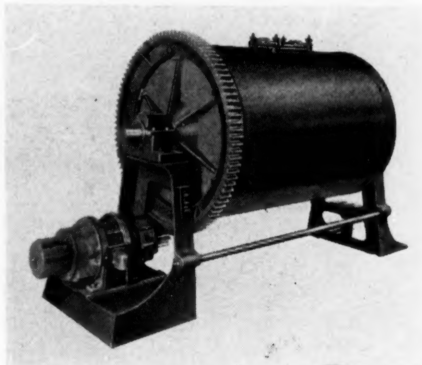
exceeds the strength of the spring, some valves will "stick shut." In this new valve, the pressures above and below the seat are equalized at the instant of opening. This equalizing or balancing action allows the use of a lighter spring and is said to assure positive opening at all times.

Photo-Electric Colorimeter QC 76

A photo-electric colorimeter incorporating some distinctive features has recently been announced. The "Lumetron" colorimeter, as it is called, has been designed for flexibility and for obtaining results reproducible within narrow limits. The construction of the colorimeter allows the use of a great variety of sample holders and filters, including monochromatic filters. As a result the instrument covers a wide field of application, ranging from simple measurements of light transmission to colorimetric and turbimetric chemical analysis. Special provisions have been made for the accurate measurement of extremely dark and extremely transparent liquids. Care has been taken to eliminate as much as possible the errors due to optical, thermal and electrical effects and to obtain stable and linear photocell response.

New Ball Mill QC 77

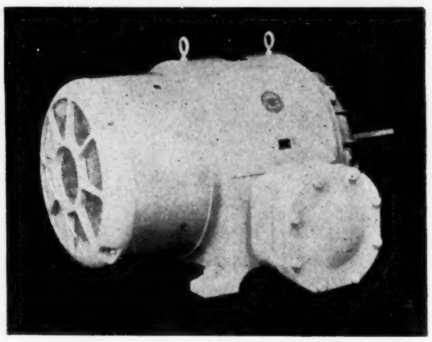
A new streamlined ball mill recently announced is of all welded steel construction with shell made of extra heavy, high carbon or chrome manganese alloy steel. The unit is a style GPH mill mounted on pedestals with broad feet. The pedestal



on the drive end has the motor base built integral with it. The geared motor rests on a machined base which permits quick and easy alignment of the gear and pinion. The mill is for wet or dry grinding of any of the products in the paint, chemical, plastics, and allied process industries.

Larger Explosion-Proof Motors QC 78

Higher horsepower explosion proof motors are now available. In Class I Group D Explosion proof motors, approved by National Board of Fire Underwriters, the ratings have been increased



from 25 to 75 H.P. while in Class II Group G they have been increased from 7.5 to 75 H.P.

Group of Naval Stores Industry Representatives Examining Cone Head Galvanized Steel Drum Accepted Recently as Merchantable Container for Rosin. Formerly Savannah Naval Stores Exchange Recognized Only Wooden Barrels as Rosin Packages.

Naval Stores Exchange

Approves Metal Drums

METAL drums as rosin containers are now official. The Savannah Naval Stores Exchange, at its March 20 meeting, approved metal drums of certain specifications as merchantable packages for transporting rosin. One type officially accepted after tests is shown in the photograph.

While some sales of rosin in steel drums have been made, official quotations of the exchange included only rosin in "merchantable wooden barrels." Thus, when rosin was sold on the Savannah Market (largest naval stores market in the world) delivery in wood barrels was, perforce, contemplated, and prices were fixed and posted on 280-lb. basis, delivered in wood barrels, weighing 500-lbs. gross or 420-lbs. net, with 80 lbs. being allowed for tare.

The actual net weight of rosin packed in wooden barrels is uncertain because some of the barrels are made heavy and some light—some of green lumber, some of seasoned dry wood. So the weight of the barrel was finally established as 80 pounds, though it is but average weight.

As the consumer could never be sure as to the net weight of the rosin he was buying, he played safe, kept the uncertainty in mind, and offered less for the rosin than he otherwise would. This state of affairs had a tendency to keep the rosin market depressed for years.

The steel drum as a rosin container has many advantages. For instance, when rosin is shipped to equatorial countries in defective or loosely made wooden barrels the rosin, under the hot sun, liquifies and leaks between the staves; and after wooden barrels of rosin are subjected to such high temperature, it is often difficult and expensive to recover the rosin that penetrates and adheres to the staves and heads.

Even in the Temperate Zone, when wood containers are stored in the open over long periods, they suffer "bottom-rot" and must be re-packed, with consequent loss of merchandise.

A very extensive research, scientifically conducted by turpentine and rosin operators over a period of years, showed steel or galvanized steel to be the best material for rosin containers.

Then began the study of size and shape of the package. Rosin is very weighty; and its container must be such as will not break when accidentally dropped from a truck or while being hoisted into a ship. It must be sufficiently sturdy to withstand severe punishment—to stand up during many transfers and while packed many deep in the hold of ships.

The Southern States Iron Roofing Company cooperated with producers and operators in making test shipments to the Orient and other far corners of the world. Reports of the condition of the package and its contents upon delivery were carefully scrutinized.

The straight side seam 22⅜ inch diameter galvanized steel drum, 35 inches high with cone head and friction cap was decided upon as the sturdiest and most economical package for both producer and consumer.

The cone head steel drum (shown in picture above) can be filled up to the tip of the cone; and after the rosin has cooled and condensed, the head is easily collapsed — oftentimes done by turning the drum bottom-side up.

The steel drum itself weighs only 16 lbs., and it holds between 520 to 525 lbs. of rosin, a larger percentage of rosin per bulk-package than ever used before.

The increasing popularity of the steel drums for handling gum rosin is demonstrated by the fact that practically all the rosin in steel drums taken over by the Commodity Credit Corporation in 1938 was withdrawn and passed into consumers' hands. The metal packages represented 13 per cent. of the government's holdings, but the withdrawal of rosin in steel drums represented over 32 per cent. of the total packages called for by the dealers from the 1938 stocks.

NEW CHEMICALS FOR INDUSTRY

Rapid drying characteristics and exceptional resistance to salt water feature this knitted bathing suit made of "Vinyon," new textile fiber, now in commercial production by American Viscose Corporation, at its Meadville, Pa., acetate rayon plant. Bathing suit, manufactured as part of a program of laboratory work to determine markets for new fiber, was recently displayed in Spring Fashion Seminar, Palmer House, Chicago.

Digest of Chemical Developments in Converting and Processing Fields

Part of the honored guests at the Subscription dinner held on Wednesday evening, April 10. Dr. Samuel C. Lind, president of the Society, is second from the right.

The Nation's Chemists Report at Cincinnati

By
WALTER J. MURPHY
Editor
Chemical Industries

SOME 3,500 of the nation's chemists assembled in Cincinnati last month to participate in the American Chemical Society's semi-annual check-up of scientific progress proceeding at an astonishingly accelerated pace in the country's leading laboratories. New developments evidencing American leadership in pure and applied research were disclosed through 450 papers and addresses in 17 major fields delivered at 56 sessions. Vitamins and nutrition, drugs, the utiization of industrial and agricultural wastes, and further expansion of synthetic industrial chemistry were easily the highlights of the convention. Efforts to improve the present rather precarious position of this country in its acknowleged dependence on outside sources of supply for drying oils were enthusiastically received.

Departing from its usual procedure, the Society held its general session on the first day of the convention. Dr. Henry A. Gardner, director of the scientific section of the National Paint, Varnish and Lacquer Association, was roundly applauded when he stated "that synthetic chemistry must free American industry from dependence upon foreign supplies of drying oils, now dislocated as a result of the war in China and that existing conditions present to American chemists the opportunity for a fascinating piece of research." He urged chemists to turn their attention to the task of producing synthetic drying oils rather than to depend too greatly upon the growing of oils to replace periodically dwindling imports.

Dr. Gardner, discussing substitutes for tung oil, reported that Brazilian oiticica oil is becoming a recognized tool of the varnish maker, and that imports have risen from a few tons in 1936 to about 19,000,000 in 1939. He pointed out to a most interested audience that the commercial development of dehydrated castor oil has been one of the significant happenings of the past two years.

For some time, of course, it has been known that if the fatty acids from castor oil were heated with a suitable catalyst the hydroxyl group would unite with a hydrogen atom from an adjacent carbon atom to form water and leave a double bond which is frequently conjugated to the one which is already in the fatty acid. In the past few years, the speaker reported, it has been learned that the same thing may be done with the original oil.

Dr. Gardner also pointed out that through the development of phenolic and modified phenolic resins, the paint and varnish industry is now in a very much more independent position.

Research into separating undesirable constituents of natural drying oils by distillation in vacuum has been started by various workers. A restudy is warranted, in the opinion of Dr. Gardner, of the methods already developed whereby petroleum is first chlorinated and then dechlorinated to introduce conjugated double bonds and drying properties. Petroleum, according to the speaker, will some day form the basic source of much of the film forming material of our industry and the above method of attack upon this problem should light the way.

Other papers of special interest to the coatings field included one by members of the Bureau of Agricultural Chemistry and Engineering pointing out that the use of lactic acid as a component of synthetic resins appears to have an excellent chance of meeting all of the requirements. T. S. Hodgins and A. G. Hovey, Reichhold Chemicals, discussed a new discovery which makes possible air-drying urea-formaldehyde-butanol resin films so that the same type of hard, resistant film which now exists on refrigerators and automo-

Committee Chairmen for the A. C. S. meeting whose program drew over 3,500 chemists to Cincinnati. They are left to right: Standing, E. B. Duffy, J. T. R. Andrews, N. B. Tucker, W. M. Burgess, W. H. McAllister, Howard Ecker, C. H. Allen, H. S. Fry, and A. O. Snoddy. Seated, W. C. Gangloff, Mrs. H. S. Fry, Miss Mildred Pfister, Proctor Thomson, H. W. Greider, and A. W. Broomell. Seated on the floor, F. E. Ray and D. J. Kooyman.

A luncheon for women chemists at the Cincinnati Business and Professional Women's Club brought together some 200 prominent women attending the 99th meeting of the Society. Among those at the speakers' table were, left to right, Dr. Mary L. Sherrill, sister of City Manager C. O. Sherrill, who is professor of chemistry at Mt. Holyoke College; Miss Elizabeth Dyer, head of School of Household Administration, University of Cincinnati; Dr. Helen Wikoff, associate professor of physical chemistry, Ohio State University, who was the speaker at the luncheon; Miss Mildred Pfister, chairman of the local women's committee; Miss Virginia Bartow, associate professor of chemistry, University of Illinois; Mrs. Katherine Dabney Ingle, dean of women, University of Cincinnati, and Dr. Evelyn McBain, associate professor of chemistry, Leland Stanford University, California.

biles may also be expected on articles which are either too big to bake or which will not stand the high temperature of baking. The use of relatively small quantities of acidic accelerators produced by the action of phosphoric anhydride upon alcohols and similar substances containing hydroxyl groups has now made possible an extremely low bake at around 140° F., and even air-drying.

Preparation of Drying Oils

Dale V. Stingley, Armour & Company, discussing recent developments in the preparations of drying oils, reported that a new process has been worked out that makes it possible to segregate the preferred unsaturated fatty acids from the non-drying fatty acids. This process comprises fractionally distilling the fatty acids, and operates in the following manner. Semi-drying fats or oils are broken down to their basic fatty acid molecules. The desired unsaturated or drying fatty acids are then isolated from the fatty acid mixture and recombined to form a new oil from which most if not all of the non-drying fatty acids have been eliminated. The drying oil thus produced can be used in paints and varnishes, while the non-drying portion of the fatty acid mixture is available for soap making, in lubricating greases, etc. Domestic production of soybean oil and sardine oil provides resources of raw materials for the application of this new method.

The advent of cheap "health" lamps emitting ultraviolet light has created the need for paints which will reflect this light so that their health-giving rays will not be absorbed by walls and ceilings. D. F. Wilcock, Sherwin-Williams, reported he has successfully made white interior wall finishes which reflect up to 72 per cent. of the beneficial ultraviolet rays.

Only a combination of certain pigments and a select group of synthetic resins can be used. One of these resins, isobutyl methacrylate, is chemically related to lucite, another, ethyl cellulose, is made from cellulose; and a third, vinylite, is a by-product of petroleum refining.

In certain phases of pigment application, according to C. K. Black, Du Pont, the present line of commonly used pigments is not adequate. This is particulary true in cases requiring extreme fastness in pale shades. These problems are encountered in the wallpaper industry, in production of printing inks for outdoor poster work and in the production of paints and lacquers for use on automobiles, houses, etc.

Several interesting things have been found. For instance, in a nitrocellulose lacquer such as is used on signs or automobiles, panels which have been exposed in Florida show that in pale shades a vat dye blue exhibits practically no fading, while an iron blue has faded quite badly and an ultramarine blue has faded completely. Vat blues and violets are the only pigments found to date which can be used to shade the extremely fast phthalocyanine (green shade) blues to red shade blues without sacrifice in light fastness.

A vat type maroon pigment has been found more durable than azo maroons previously used and which several years ago were notoriously poor in durability.

In addition to the above-mentioned uses vat dye pigments find application in cold water paints, plastics, the dyeing of paper pulp, rubber, linoleum, etc.

Dyes in Textile Work

In general, vat dyes as sold to the textile trade are not in proper physical form for pigment work. It is necessary to treat them in such a way that optimum pigment characteristics are obtained. This treatment differs greatly depending on the dye and the use to which it is to be put. For instance, on wallpaper a sample of a vat pink which has been ground to a very fine particle size exhibits a great deal more tinctorial strength than a sample prepared for textile dyeing.

Vat dyes are more expensive than most pigments in use today, but it appears that for certain purposes they are the only type which will solve certain pigment problems. Since their outstanding property is fastness to light in pale tints, their cost does not necessarily exclude them. The amount of pigment required to produce such a tint is small, amounting in most cases to only a small fraction of a pound per gallon of paint or ink.

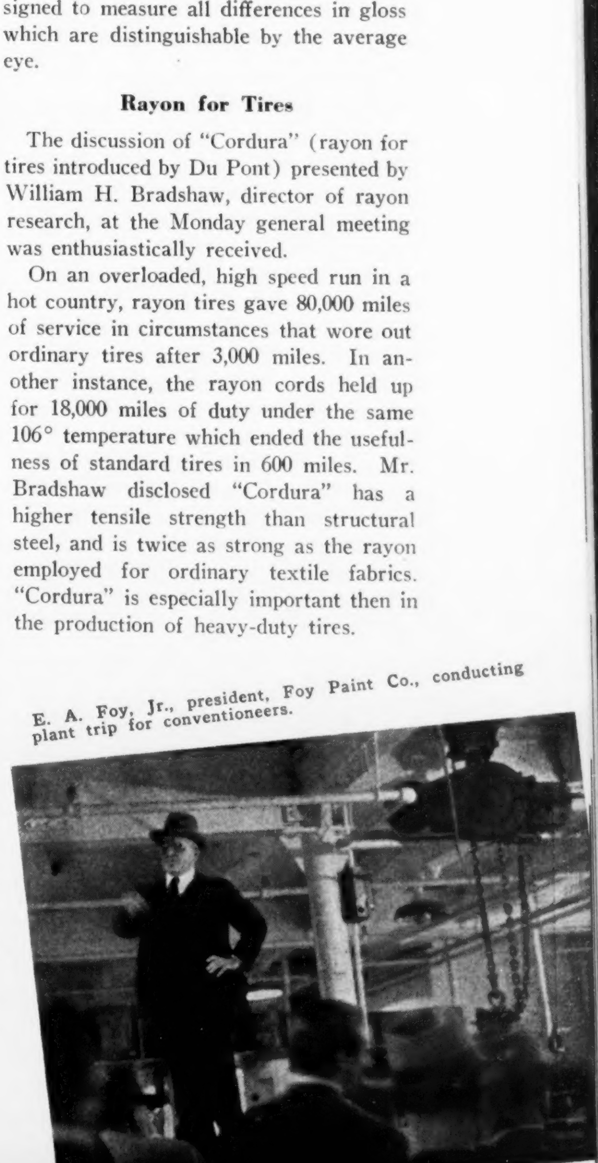
A new goniophotometer, an instrument for measuring the intensity of light reflected from a surface at different angles, was reported on by L. A. Wetlaufer and W. E. Scott, also of the Du Pont organization. The speakers also discussed a technique and method or interpretation whereby factors which have interfered both with visual judgment of gloss and its measurement have either been eliminated or accounted for. The instrument is designed to measure all differences in gloss which are distinguishable by the average eye.

Rayon for Tires

The discussion of "Cordura" (rayon for tires introduced by Du Pont) presented by William H. Bradshaw, director of rayon research, at the Monday general meeting was enthusiastically received.

On an overloaded, high speed run in a hot country, rayon tires gave 80,000 miles of service in circumstances that wore out ordinary tires after 3,000 miles. In another instance, the rayon cords held up for 18,000 miles of duty under the same 106° temperature which ended the usefulness of standard tires in 600 miles. Mr. Bradshaw disclosed "Cordura" has a higher tensile strength than structural steel, and is twice as strong as the rayon employed for ordinary textile fabrics. "Cordura" is especially important then in the production of heavy-duty tires.

E. A. Foy, Jr., president, Foy Paint Co., conducting plant trip for conventioneers.



Outstanding paper in the industrial chemical field was presented by Dr. M. C. Taylor, J. F. White, G. P. Vincent, and G. L. Cunningham of Mathieson Alkali and discussed the development of a practical method of manufacturing sodium chlorite. This work promises marked improvements in at least two of our basic commodities—paper and textiles and holds out possibilities to the kraft paper industry and as a likely household bleaching agent.

For years, it has been assumed that it is chemically impossible to bleach cellulosic fibres such as paper, cotton, etc., without some loss in the strength of the fibres. Careful control has, in many places kept this strength loss to a minimum in industrial bleaching. But it was not, according to the authors, until the commercial development of sodium chlorite that an agent was found which could bleach satisfactorily with absolutely no effect on the fibre strength. It would appear that sodium chlorite manages to discriminate between cellulosic matter and the coloring and other foreign matter which it is desirable to eliminate. The trade marked product "Textone," which contains the new chemical as the essential ingredient, is being used both to simplify and lower the cost of the bleaching operation and to improve the quality of the finished goods. According to the speakers, white goods bleached with Textone are whiter and longer wearing; goods which are to be dyed take the dyes more uniformly and are likewise more durable. The product can be used on cotton, rayon, spun rayon, rayon-cotton mixtures and pigmented rayons. An interesting possibility for the future is the bleaching of nylon. Preliminary studies indicate that this can be done, under proper conditions, with the amazing result of a perceptible increase in the strength of nylon.

Ethylene glycol, when so treated with "inhibitors" as to prevent foaming, corrosion and leakage, makes the most satisfactory anti-freeze for the modern automobile, according to Dr. H. Lamprey and D. H. Green of National Carbon.

Studied Liquids 10 Years

Conclusions set forth in the report are based on 10 years of study of anti-freeze liquids. This study comprises laboratory and field tests of more than 15,000,000 miles of driving. The research covers not only the performance of ethylene glycol, but that of ethanol and methanol, the two commonly used alcohol anti-freeze materials.

Contrary to popular belief, the report asserted, heat rather than cold is the real test of an anti-freeze. The constant tendency toward higher engine temperatures makes more and more necessary the use of an anti-freeze capable of resisting the physical and chemical changes which great heat induces.

Petroleum Formation

A great deal of discussion greeted Dr. Gustav Egloff's theory that petroleum probably is being formed in the earth at present on a substantial scale, in direct contradiction to the often expressed contention that the substance is of limited extent and irreplaceable by nature. Dr. Egloff is director of research of Universal Oil products. The formation of oil may be continuous, Dr. Egloff held.

"Establishment of this view might have a profoundly changing effect on conservation practices and policies now in effect," he said, "Quite possibly, too, it might have ultimately a tremendous influence on basic economic aspects of the industry."

Chemicals from Wood

To industrial chemists and chemical engineers the report by Robert M. Boehm, director of research of the Masonite Corporation, on how this company's research department has succeeded in taking the liquid fraction of the wood employed and converting it into chemicals, including furfural, acetic acid, formic acid, acetone and methanol, was of more than passing interest. At present these are being produced on a pilot plant scale with promise of large-scale production in the very near future. Further, the Masonite Research Department has now discovered a new method by which wood can be converted to an activated carbon of better properties than at present possible from coconut shells and in any quantities so that we are no longer dependent upon coconut shells in case of a national emergency.

Summarizing briefly, members of the research department of the Wm. S. Merrell Company, discussed cetyl pyridinium chloride, which promises to be the answer for a new germicide similar in properties to certain mercurials, but which will be odorless, non-staining, comparatively inexpensive, non-toxic, and which does not contain heavy metals.

A. J. Nolte and H. W. von Loesecke of the U. S. Citrus Products Station, Winter Haven, Fla., reported that commercial production of grapefruit-seed oil is one of the newest industries in Florida. The oil can be refined and used in salad dressings and for other edible purposes but under present conditions it is of greatest value when used in the textile industry.

Grapefruit-seed oil can be sulfonated to give a turkey red oil. It is reported that this sulfonated oil is highly effective as a mordant and combines with certain dyestuffs to form insoluble compounds and serves to produce a fixed color in a textile or fiber.

B. Conner Johnson, Professor W. H. Peterson, and W. A. King, University of Wisconsin School of Agriculture, reported that silages preserved with phosphoric acid and molasses increases the vitamin A potency of the milk derived from cows fed on such treated silage.

New Vegetable Oil Supply

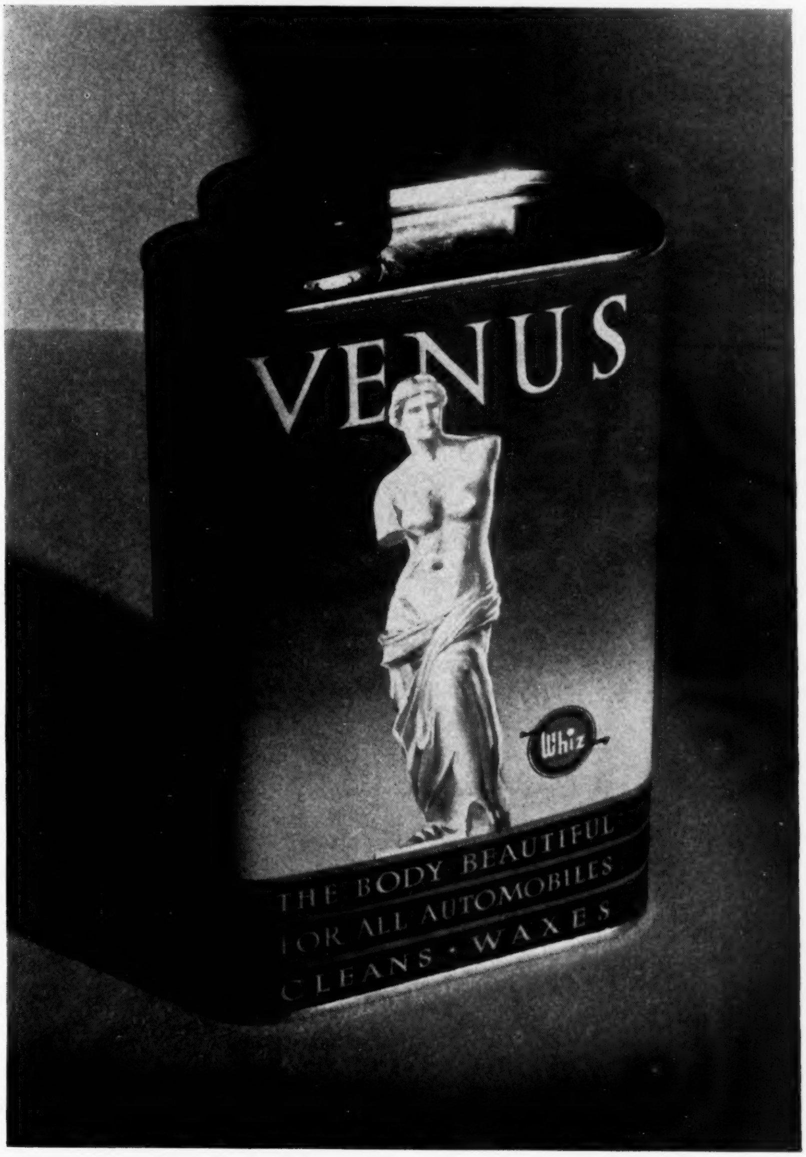
A new vegetable-oil supply has been recently opened, according to members of the staff of Southwestern College, Winfield, Kan., which would seem to furnish a new industry. The Kentucky coffee bean tree, *gymnocladus dioica*, is the source and is widely distributed from Western New York to Tennessee, Oklahoma and Kansas.

George W. Priest, Woburn Degreasing, reported that a modern, fully equipped plant for the manufacture and sale of insecticides derived as a byproduct of the castor plant has been established at Brooksville, Fla., in the heart of the citrus region, and is doing a business of considerable volume.

By the same kind of process with which Germany is now creating much of its gasoline from coal Canadian chemists are now making liquid wood. Water-white liquids are being obtained which chemists believe will provide the raw materials for a future synthetic organic chemical industry. Prof. Harold Hibbert of McGill University described the new way of making liquid wood.

The candid camera of *Chemical Industries* was busy as usual at the A. C. S. meeting. Left to right are: Samuel Olof Sorensen, Archer-Daniels-Midland; L. H. Flett, National Aniline; Herbert Sliger, Commercial Solvents; J. J. Vetter, Natural Products Refining; Edward L. Gordy, W. C. Hardesty Co., and C. H. Rose, National Lead. Mr. Rose is also president, N. Y. Paint Production Club.

CHEMICAL SPECIALTIES



Venus, a combination polish and cleaner for automobiles, has been marketed by R. M. Hollingshead Corp., Camden, N. J. Product, according to company, contains a special ingredient that softens, loosens road film and leaves a heavy wax coating of Carnauba and Ozokerite waxes on surface. Can was designed by Ferdinand J. Obeck.

INDUSTRIAL · HOUSEHOLD · AGRICULTURAL

CHEMICAL
INDUSTRIES

Complete line of paint materials shown in Kresge window with demonstration aimed at women shoppers.

Merchandising *Chemical Specialties* To Chain Stores

THE question of merchandising may in its turn be as much or more of a problem than the difficulties of formulation and manufacture. Once the process of making a chemical specialty has been satisfactorily worked out that part can be pretty much left to itself, possibly with occasional slight modifications and improvements, but the question of selling is one that requires continued effort and study, even after a product has established a name for itself. How to get on the market and how to stay there?

The housewife, the ultimate consumer of the chemical specialties which are referred to here, such as furniture polish, floor wax, ammonia, etc., obtains these supplies through various outlets. These include the retail hardware store, the independent grocery store, the department store, the five-and-ten-cent store, and the grocery chain store. There should be no difficulty in placing a product in the small retail store, but the cost of dealing with retail stores on an individual basis is naturally very high and then there is no assurance that the product will move. Too often sales methods and a check of turnover are on a haphazard basis with the small proprietor. In order to get into the chain store and stay there the product *must* move. The buyer for the chain therefore has to be convinced that there is reasonable expectation of this before he will touch it.

The chain store can never be approached through the store manager but only through the buyers located in the central executive offices. Woolworth's may be considered tops among the ten-cent chains and the Atlantic and Pacific among the grocery chains, since each represents the greatest distribution possibilities in its own field, and is probably also the hardest for a product to get into in its field. As noted in a previous article Woolworth's operate on a wide margin of gross profit, the minimum being 37.5 per cent., corresponding to payment to the manufacturer of $9.00 a gross for an item to retail at 10 cents. A more usual rate is $8.40 or $8.00 a gross, other rates paid varying on down the scale through $7.80, $7.60, and $7.20. A chemical specialty in most cases cannot be sold at the lower rates and leave any profit for the manufacturer. Whatever price is agreed on with Woolworth's must also be offered to other chains, including the A. & P.

The Atlantic and Pacific can operate on about half the gross profit required by Woolworth's. One reason is lower basic ground rent, another is that the A. & P. stocks only 1200-1700 items as compared with 5000-6000 carried by Woolworth's, and therefore requires a great deal less space with a much smaller overhead. Although from our point of view the two stores have something in common in that they both carry a line of chemical specialties, they differ greatly as to function in the mind of the housewife who is their principal patron, at least in the first case. The basic idea of low price behind the ten-cent store has become so firmly fixed in people's minds that it is no longer necessary to keep all prices at the original level. The function of the store is still the same without its being bound to a ten-cent limit.

The ten-cent store is part of the shopping center of a town. Although people go there to buy some particular item they often wind up by purchasing several others simply because they see them on the counter. This sums up the whole idea of ten-cent store sales. To be successful the item must sell itself, either because it looks like a good buy for the money or simply because of eye appeal. In the case of a chemical specialty it should be both. With utilitarian products of this type eye appeal may not be so important but it cannot be ignored. The package should be as attractive and neat-appearing as possible, and where explanatory matter is needed, this should be in a form to catch the eye readily and to be easy to read. Glass bottles not only are cheaper packaging agents than tin cans but they offer the distinct advantage in a product that must sell itself, of permitting the purchaser to see what the material looks like. Tradition is sometimes a limiting factor in this respect, for example, people expect to buy furniture polish in a bottle but floor wax in a can.

When selecting brands—and several brands may compete with each other side by side—the buyer naturally gives preference to those which are nationally advertised and will pay his higher level or even his highest price level for these. The unknown competitor not only has to take a lower price but quite commonly has to

offer a larger amount of his product at the lower price. While the buyer is not primarily interested in size but only in his gross profit, the final purchaser may be induced to take the unknown brand because it looks like more for the money than the brand with which he is already familiar. The product must sell for there will be no re-orders. A very careful check is kept on the rate of turnover,—woe to the product that can't keep up the pace. The aim of the manager is to keep sales per square foot of counter space as high as possible.

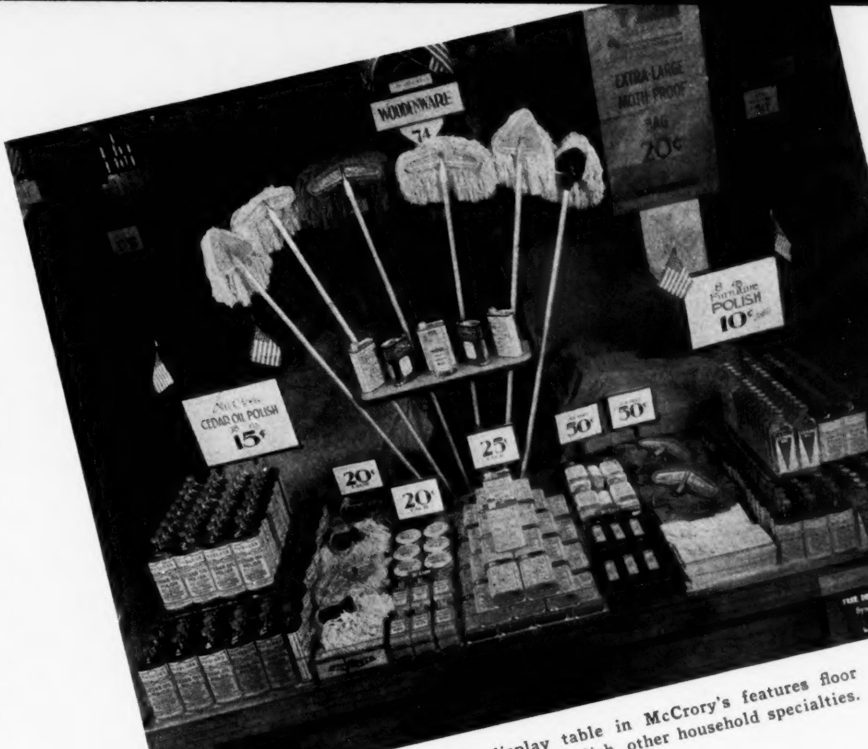
In the large Woolworth stores half a dozen brands of the same article may be sold. How to get yours among them? Aside from considerations already dealt with, the product should have intrinsic merit, it should be of good quality. Chemical specialties are not essentially ten-cent store items, but are frequently made so on the basis of smaller packaging. The articles are already familiar through other sources and sell through the ten-cent chain because the demand has been created. The housewife may well know that she is apt to be getting less for her money when she purchases a ten-cent package than when she purchases a 29-cent package of the same thing, for example fabric cleaner, but the item may be one that she keeps on her shelf for such a long time that a ten-cent size is all she wants. Then there is good psychology for the ten-cent item; it seems like very little money even to the people in the small-income brackets. They often feel that the less they pay out at a time, the better, even though it may not be the most economical method in the long run.

In some cases sales material can be prepared illustrating the results of actual tests in which the new product showed up better than those of competitors. For example with paints and enamels, the results of weathering tests, salt-water treatment, elasticity, and many others can easily be shown. Usually the buyer has at hand several hundred samples. He may select one of these that he considers satisfactory and make a practical demonstration himself to compare its performance or appearance with that of your product. If he decides to take it, he may order only a few dozen to go to one or more trial Woolworth stores. These trial stores are a few selected larger stores. If the report is satisfactory regular orders may be made. In the large Woolworth stores a good many brands and a good many items are sold which space does not permit of in the small stores. The latter are governed by a "check list" of goods which the store must carry. Once an item gets on this list it is carried by all the Woolworth stores except that the list may vary according to the section of the country, it being roughly divided into an Eastern Section, Midwest and Coast. These items are those in such demand that the company feels they must be carried, or those on which they know they can make a good profit. The large stores have considerable leeway beyond the check list and this leeway is where the forerunners of the check list get a start. While the list may be static as to certain types of articles, it no doubt undergoes constant change and study with regard to particulars.

Some manufacturers have placed their products in Woolworth's by offering them as exclusive with Woolworth. Or they may label them "Woolco" or "W" indicating that it is Woolworth's own brand. Such packages are usually more generously proportioned than the standard brands. As an illustration, a 10-ounce bottle of Parson's ammonia sells for 10 cents while a 32-ounce (1 quart) bottle of "W" ammonia exclusive with Woolworth's also sells for 10 cents. In this case it would be easily possible to have the same amount of active ingredient present in each case, but not all materials lend themselves to extension as readily as ammonia. In most cases brand names mean very little in Woolworth's. The customer usually asks for shoe polish, or turpentine, or rat poison, or glass cement or some other household aid.

Chain stores have their own warehouses, as do many manufacturers. Sometimes material is shipped directly to the stores and sometimes not, the destination showing up in the price. If a manufacturer has one specialty accepted, it is easier for him to sell the chain another specialty because of its favorable effect on shipping. If a store manager can get two or three items from the manufacturer in a 100-pound shipment, this helps him to keep his stock down. Therefore the more items per shipment the better. For this reason it is not surprising to find several unrelated products in the ten-cent chains carrying the same brand name.

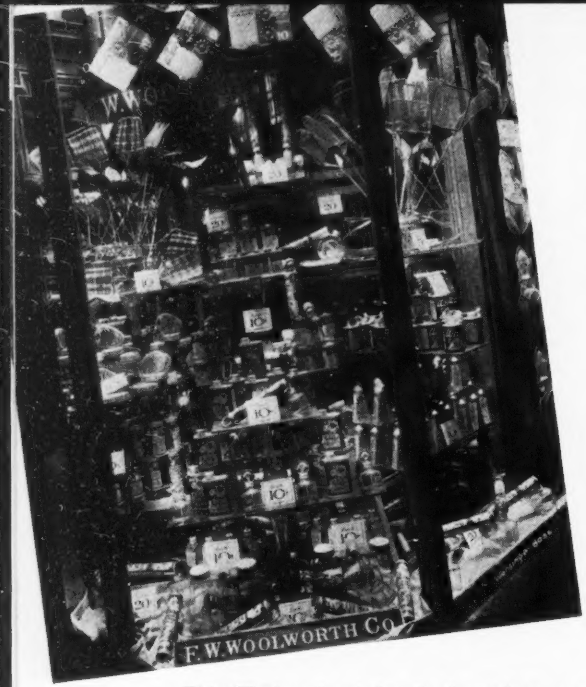
The writer was surprised to find among the chemical specialties in the ten-cent chain, a proportionately very large amount of counter space given over to paints, varnishes and enamels. This would indicate that the housewife and her husband are both turning to the ten-cent store for their supplies of this kind, probably because for the minor repair or repaint job done by the amateur only a small amount



Open display table in McCrory's features floor wax, furniture polish, other household specialties.

Illustrations
Comparison of a few Typical Woolworth and A. & P. Products

Woolworth Product	Size	Price	Atlantic & Pacific Product	Size	Price
Collin's Kleerpane	3 oz.	10c	Windex	6 oz.	15c
Johnson's Liquid Wax	1/3 pt.	20c	Johnson's Liquid Wax	1 pt.	59c
Sani-Flush	10 oz.	10c	Sani-Flush	1 lb. 6 oz.	21c
CN Disinfectant	1 oz.	10c	same		
Collin's Lemon Oil	8 oz.	10c	Wilbert's Furniture Polish (lemon oil)	12 oz.	15c
Flit Insect Spray	6 oz.	10c	Flit Insect Spray	8 oz.	15c
3-in-One Oil	1 oz.	10c	no machine oil carried		
Grady's Metal Polish	6 oz.	10c	Noxon	8 oz.	18c
Electro-silicon Silver Polish	4 oz.	10c	same		
Wipe-on Varnish	4 oz.	20c	no varnish carried		
Enamel-on	4 oz.	20c	no enamel carried		



This Woolworth window is devoted to promoting insecticides; pest control products.

of material is needed. What he hopes to buy is just enough to fill his immediate requirements.

In an interview with the vice-president of the eastern zone of the National Paint, Varnish and Lacquer Association, he expressed the candid opinion that the paint industry is doing the poorest job of merchandising of any industry. The housewife is apt to associate paint with something with a disagreeable odor which she hates to have around because it sometimes gets spilled or spattered and makes a confounded mess.

Instead displays and, as far as possible, packages should carry a message of fresh color and cleanliness, a psychological factor of something cheerful,—not what paint is like in the can, but what it will do. Montgomery-Ward sets rather an example in this respect with a display showing what results can be obtained with paint accompanied by a color scale, a chart of how much is needed in terms of area, and price.

Many people, especially women, who start out to buy paint, varnish or enamel don't themselves know what they want, and the ten-cent store clerk isn't much help. If the sales clerk could be taught in a brief lecture or by means of an illustrated booklet the essential differences between these three surface coatings, the explanation being given in very simple language, she would greatly increase her value to the customer and no doubt her sales production. What the sales girl should be able to do is to ask the customer what he or she wants to use the material for and then explain to him what would be most suitable for the purpose. It would no doubt be worth while for the manufacturer to supply the information and printed material where the stores were found willing to cooperate.

A method of introduction which has proved successful with some products is by the use of demonstrators. The manufacturer pays the demonstrator's salary, the store merely furnishing the space and giving a better price agreement for products being demonstrated. However, the specialty manufacturer doesn't make money while the demonstrator is working, that is merely promotional work from his point of view. The store manager is very glad to have demonstrators on materials of quality, since it means big sales with little cost to him. One product which has been regularly demonstrated in the S. S. Kresge stores brings in \$150-\$400 a week for a six-foot space during the demonstration period. Following this introductory period the product has to sell itself and has succeeded in doing so.

An interesting and perhaps unexpected development from the work of the demonstrator is that the product is sold directly to a number of other customers than those in the retail class. Inquiries have come in from plant executives who think they could use the article in their plant, either for the factory itself or in some stage of their own manufacture. An example of this is the use of Wipe-on varnish on the plywood wings of the new "Clark 46" airplanes made with a laminated plastic fuselage. This new application was the direct result of someone seeing a Wipe-on demonstrator at work in a ten-cent store. While demonstrations are designed to attract attention by their spectacular nature, still they must be genuine in that the product must do everything claimed for it The fake demonstrations which one sometimes encounters have no interest in or relation to re-sale.

Grocery Chains Differ

In the grocery chain such as the Atlantic and Pacific, the merchandising of chemical specialties is on a somewhat different basis than in the ten-cent store. The housewife may visit this store regularly three or four times a week. As a result of personal contact she is known to the clerks and the store manager wishes to please her by supplying as many of her needs as possible. Although her primary interest is in buying food, she also expects to buy her soap and other cleaning products here. However, this is never a case of casual shopping where she picks up such items from the counter. Counter space is occupied almost entirely by foods, so that she must ask for her other supplies. This she usually does by brand name, at least much more so than in the ten-cent store. For example, Windex, the best known glass cleaner, she would ask for by name since she probably learned about it through its national advertising. While Windex is an A. & P. item, the ten-cent stores carry products at a lower price which carefully imitate Windex in appearance by the use of the same shade of blue dye. They are not the same in composition but unless the housewife has been thoroughly sold on the name the similar appearance might be enough to satisfy her.

The A. & P. store manager works from a warehouse list prepared by the buyers. He is not required to stock all these items but knows he can order them at any time. He also has the privilege of asking the buyer to get for him any product which he thinks his particular customers want. Like the ten-cent store manager he keeps a careful check on turnover and carries stock that he knows will move. He seldom stocks more than 3 brands of an article. If only one brand is carried it will be either a nationally known brand or the Atlantic and Pacific's own brand. A few items are carried without any profit to the store simply as a convenience to the customer who demands that particular brand of some rather high-priced product. The profit he doesn't make on this he has to make up on something else, probably his own brand. While the prices of A. & P. products have no set scale they are probably as low as will be found in any comparable outlet.

An attempt has been made to cover the pertinent facts which the manufacturer might want in dealing with a chain organization. Some are admittedly discouraging; it is hoped that enough are encouraging to balance these. At least, every effort has been made to give a true picture.

Takes Over "Ant-B-Gon"

California Spray-Chemical Corp., Richmond, Cal., and Elizabeth, N. J., has taken over manufacture and distribution of "Ant-B-Gon" dispensers and ant poison, together with exclusive use of trademarks and patents formerly held by Ant-B-Gon Company of Los Angeles.

Dyrud to Build Plant

Dyrud Laboratories, Freeport, Ill., will build a plant at Prairie du Chien for manufacture of "Kleen Kloz," cleaning compound. A 10,000 gallon storage tank and pumping station will be erected in conjunction with the plant.

Carolina Chemical Organized

Carolina Chemical Co., organized by S. A. Saul to distribute commercial chemicals, sanitary supplies, will open headquarters in Charlotte, N. C., with a manufacturing plant at Conover.

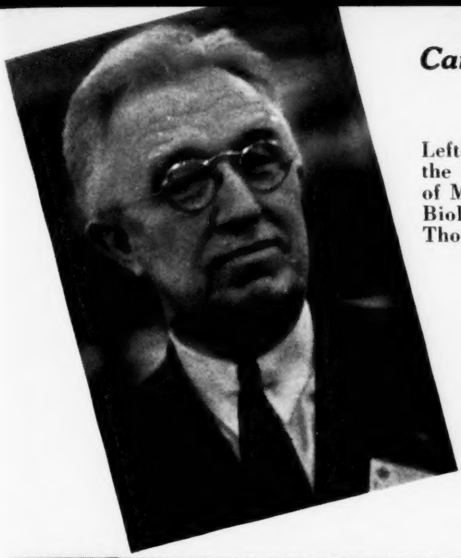
Promotion Agency Expands

Belnap & Thompson, Inc., Chicago sales promotion agency has expanded N. Y. City offices, taking new quarters in Graybar Bldg., 420 Lexington ave.

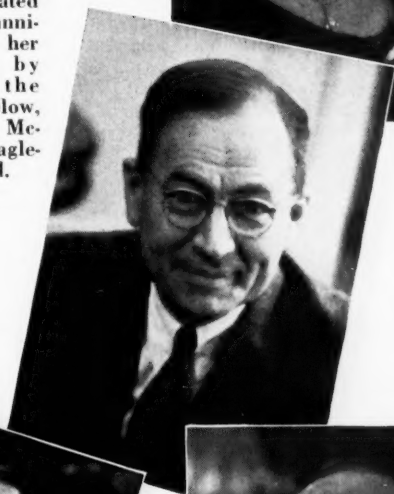
Lucidol Plant Moved

Lucidol Corporation has moved its plant to 1740 Military Road, Buffalo.

Candid Camera at Cincinnati Meeting of the American Chemical Society

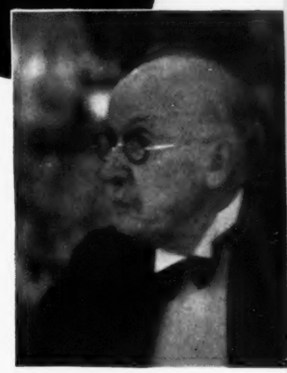


Left—Prof. William Lloyd Evans, Ohio State, president-elect of the Society; right, Dr. Eric G. Ball, of Johns Hopkins School of Medicine, who received the $1,000 Eli Lilly & Co. Award in Biological Chemistry. Below, F. J. Curtis and Dr. C. A. Thomas, both of Monsanto.

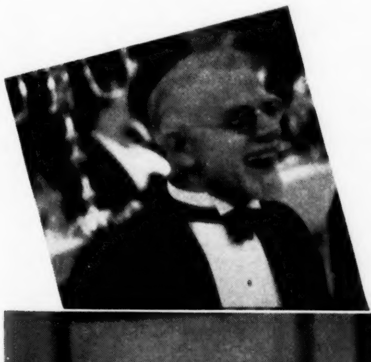


Right—Mrs. Edgar Fahs Smith, who celebrated the 61st anniversary of her marriage by attending the meeting; below, Dr. E. W. McMullen, Eagle-Picher Lead.

Groups above were photographed in the Emery Industries' suite at the Netherlands-Plaza. At the top, K. L. Schanbacher, E. W. Resse, both of Emery; W. T. Reddish, W. C. Hardesty Co. Below, E. Colt, Armour; N. A. Ruston, Emery Industries; D. V. Stengley, Armour; Ken Coate, Calco.



Above—Dr. Gustavus J. Esselen, Boston consultant; right, Dr. Edward Bartow, University of Iowa and former president of the society.



Above—left, Dr. Charles A. Kraus, Brown University, and former president of the society; to his right, Dr. Walter E. Lawson, Du Pont. To the left, Dr. William F. Zimmerle, Du Pont, and James G. Park, Standard Alcohol.

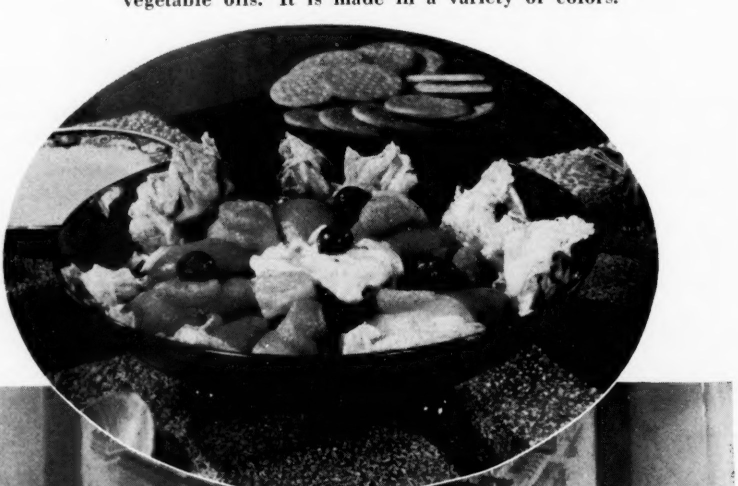
Below—left, Walter Ralph and right, E. J. Boehm, both of National Aniline.

Above—Dr. J. W. Marden, assistant research director, Westinghouse, studies spectrum of experimental tellurium-vapor lamp through a spectroscope, while Dr. N. C. Beese takes notes. Lamp produces a continuous visible spectrum of light almost identical with that of direct sunlight. "Daylight" output is achieved only at low operating temperature, low internal pressure, and low power input to lamp, which is the converse of incandescent lamp behavior.

Below—Industrial Rayon Corp., exhibition at Western Reserve University celebration commemorating 100th Anniversary of founding of chemistry department. Rayon fabrics provided background for demonstration set up of thread-advancing reels used in continuous processing of rayon.

Left—Young lady featured in fashion shows sponsored by National Association of Manufacturers is known as "Miss Chemistry." She is dressed from head to foot in apparel made from materials developed in DuPont laboratories. Materials include, rayon gown, cellulose acetate plastic hat brim, jewelry of "lucite" and nylon fiber stockings.

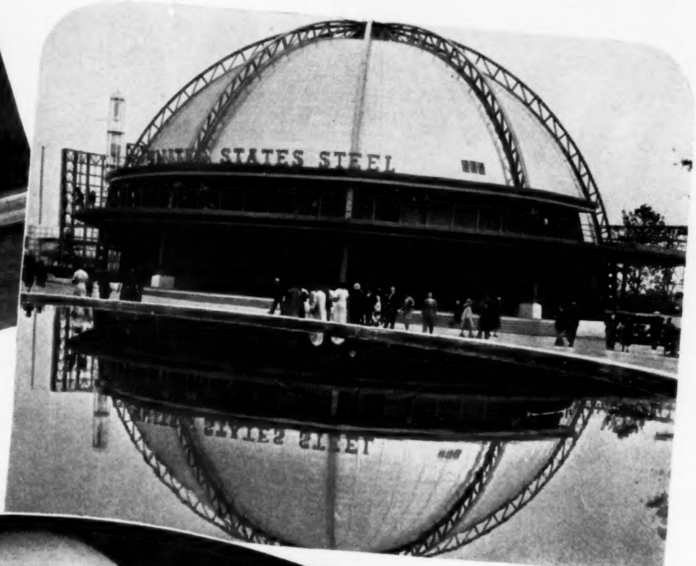
Below—Salad bowl being produced by Kilgore Manufacturing Co., is molded of Bakelite polystyrene because of its resistance to vinegar, and vegetable oils. It is made in a variety of colors.



This group comprises four of the oldest employes of The United States Stoneware Co., Akron. They have been employed continuously for periods ranging from 42 to 60 years. They are: (left to right) Edward Selzer, Lorenz Selzer, Philip Long, 60 year employe, and William Bell.

Fair Re-opens

Above—General Electric exhibit of "man-made lightning" which fascinated visitors at World's Fair last year, will again be a magnet during the budding season now getting underway on Flushing Meadows.



Above — United States Steel building presents this odd effect due to reflection in lagoon facing the structure.

Left—Few visitors to the World's Fair, footsore though they may be, ever leave before viewing the entrancing night scenes. Breath-taking effects, such as the spotlighted perisphere casting part of its brilliance onto the mirror-like surface of the lagoon, make the wait worthwhile.

Right—Fountain of the Atom is sculptor's idea of what goes on in a particle of matter. Upper figures symbolize earth, water, fire, and air.

Below—Westinghouse exhibit will again show the wonders being performed in company's research laboratories.

NEWS OF THE MONTH

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Southern Alkali Elects New President

Harold F. Pitcairn who has been elected president of the Southern Alkali Corporation, subsidiary of the Pittsburgh Plate Glass Company, succeeding Hugh A. Galt, who retired recently. Mr. Pitcairn is a director of Pittsburgh Plate Glass, president of the Autogiro Company of America, and proprietor of the Pitcairn Autogiro Company. He has been associated with Pittsburgh Plate Glass Company for many years, first serving in its Efficiency Department in 1919. He served in the Army Air Corps during the World War and in 1925 began building airplanes. In 1927 Mr. Pitcairn operated an air mail line from New York to Atlanta. He sold his line and formed the Autogiro Company of America.

IN REVIEW

MINIMUM WAGE SCALES LEAD TO DISCRIMINATION

Warren N. Watson Points Out that Splitting of Chemical and Allied Products Industry into Many Over-Lapping Subdivisions with Different Rates for Each Group Will Create Impossible Situation in Administration of Walsh-Healey Public Contracts Act

SETTING up of minimum wages for chemical and related industries under Walsh-Healey Public Contracts Act requires careful study to avoid discrimination in favor of one branch of the industry, where manufacturers in two or more fields are bidding on the same product, W. N. Watson, secretary of the Chemical Alliance declared at a public hearing on the measure.

"Trend in recent years in chemical and related industries has been conspicuously toward diversification of products," he pointed out. "Thus, we find the fertilizer manufacturers broadening their range of products by entering more and more into the manufacture and sale of chemicals. Likewise, firms in the Drug Industry are broadening their range of chemical products.

"For example, firms grouped in the Fertilizer Industry manufacture and sell such chemicals as sulfuric acid, phosphoric acid, trisodium phosphate, disodium phosphate, calcium acid phosphate for food purposes, pyrophosphates, ammonium carbonate, elemental phosphorus, copper compounds, agricultural insecticides and fungicides, sulfates of copper, zinc, iron and manganese and other products, all of which sales are in active and direct competition with firms under the definition of the Chemical and Related Products Industry.

"A review of government bids also reveals that the insecticide—arsenate of lead—was supplied on one government bid by a fertilizer company. Sulfuric is made and sold by the Fertilizer Industry, the Chemical Industry, and also the Explosives group. The Secretary has fixed minimum rates of 30, 40 and 50 cents for the Fertilizer Industry, and 57½c for the Explosives Industry; thus the Explosives group is at a disadvantage in sales of this product.

"The minimum wage determined for the Drug Industry was 37½c. This includes firms manufacturing not only U.S.P. drugs but a large variety of fine chemicals and also technical chemicals, all of which are sold in competition with many firms under the 'Chemical and Related Products Industry,' as firms in the latter group produce U.S.P. fine chemicals and technical chemicals in addition to heavy chemicals.

"For example, a list of government awards shows that one product purchased by the Navy—mercuric oxide—was supplied by one of the firms grouped under the Drug Industry, although this is manufactured and sold by a firm in the Chemical and Related Products Industry. Consequently, if a wage were fixed for the Chemical and Related Products Industry substantially above that of the Drug Industry, it would involve a discrimination in favor of the Drug Industry because two different wage scales apply to the same products—U.S.P. chemicals.

"There is no fine line separating firms that manufacture heavy chemicals, fine chemicals, and U.S.P. chemicals, and any substantial spread in the wages between the Drug and the Chemical and Related Products industries will result in a serious economic disturbance on the placing of government contracts.

"The minimum wage determined for the Soap Industry was 40c per hour. This is a division of the Chemical and *Allied* Products Industry, and here again certain firms under the Chemical and Related Products Industry manufacture soap and related products, as well as chemical products. Government bids for chemical products such as cresol and bleach have been placed with soap manufacturers.

"It is emphatically evident that the splitting of the Chemical and Allied Products Industry into many overlapping subdivisions with different rates for each group will create an impossible situation in regard to administration of the Walsh-Healey Public Contracts Act because of the overlapping in the production of chemical products by different subdivisions of the industry.

"In conclusion, we wish to point out, on the subject of minimum prevailing rates, that the data compiled by the Public Contracts Division, which we regard as not representative, show that in the Southern District 21.57% received 40.9c or less per hour. Furthermore, in the Northern District 6.26% received 50.9c or less per hour. To assure the maintenance of effective competition and to avoid the dislocation of competitive conditions, we wish to emphasize the importance of closely relating the minimum wages to be determined by the Secretary for the Chemical and Related Products Industry to those minimum wages already established by the Secretary for other subdivisions of the chemical industry, specifically: Drugs—37½c per hour; Fertilizers, West — 50c, South — 30c, and North—40c.

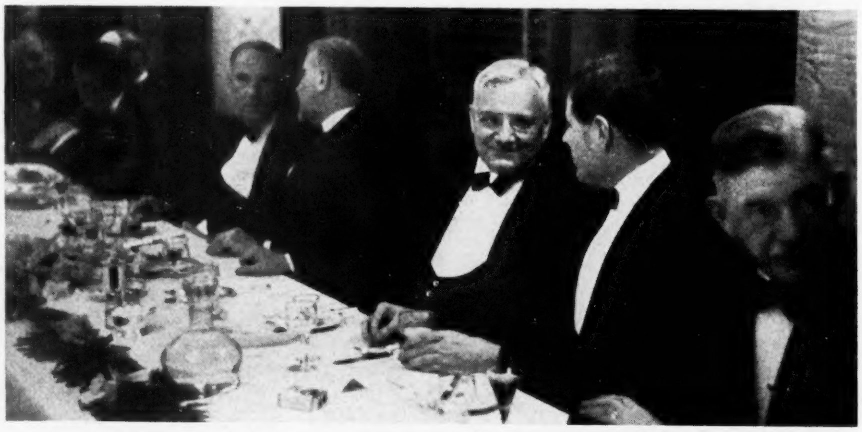
Chemical Earnings Surprise

During the first quarter of 1940, the chemical industry weathered the recession very well, and got off to a fine start by piling up a volume of business that was close to record levels reached in final quarter of 1939.

As a result of fine sales record, earnings of a number of producers are much better than expected. Among the leaders were E. I. du Pont de Nemours & Co., Inc., with quarter earning of $2.04, Union Carbide and Carbon with all-time record of $1.13 and Hercules Powder with net of $1.22, best in over 10 years.

Other large gainers were American Cyanamid, Commercial Solvents, Atlas Powder, Monsanto and Air Reduction.

New products and constantly increasing diversification is generally considered responsible for stability against business fluctuations.



"Progress in the Food Industry" was the subject discussed by prominent executives in that line before a joint meeting of the American Section of the Society of Chemical Industry and the American Institute of Chemical Engineers. Dr. L. V. Burton, editor of *Food Industries* (third from right) presided. Speakers were A. C. Monagle, Standard Brands (talking with Dr. Wallace P. Cohoe); W. L. Campbell (Kroger) talking with Dr. Burton. At extreme right, Dr. Walter H. Eddy, Good Housekeeping Bureau.

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● Sodium Silicate is one of the most widely used chemicals in modern industry. Its potentialities and the flexibility of its properties make it adaptable to countless uses. Made in a number of grades GRASSELLI Sodium Silicate is available for prompt shipment from plants and warehouses advantageously located in the principal industrial sections of the country.

If you are a manufacturer of soap, textiles, paper or any product requiring the use of an adhesive, coating agent or detergent, there is a grade of GRASSELLI Silicate adaptable to your requirements.

F. No. 9, J. M.
These are the most widely used commercial solutions having gravities of 40°, 41.5° and 42.5° Be, respectively, and a relatively low alkalinity. Used as an adhesive, sizes and coatings, as a binder, a deflocculant and a detergent.

9 X Mineral Adhesive
For adhesion of fiber to metal.

No's. 1, 6, 7, 14, 26, E. S.
Binders for abrasives, grinding wheels and in the manufacture of refractory and acid-proof cements.

No's. 20, 30, W. W.
For use in the Textile Industry.

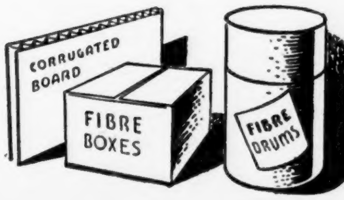
G. 4S. **(GRASSELLI Special Sealing Sodium Silicate)**
For sealing shipping containers.

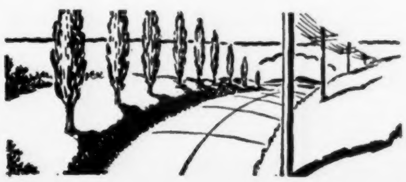
2x, 54x
Used for coatings of grease-proof papers.

R-B
Used for curing and hardening concrete surfaces.

57x - 67x
Used for manufacture of solid fibre, corrugated board and special adhesive requirements.

GLASS **(lump, granular or powdered)**
Used for briquetting, as insulation binder and welding rod coatings.





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Washington

Russell Kent

CONGRESS is striving mightily to adjourn by the middle of June. Chances favor success of this effort.

The fag-end of a congressional session always increases the hazards of prophecy because it is the period of trades. But here is a condensed forecast of the prospects for enactment of legislation of major interest to the business world, emphasizing that Presidential approval is a part of the process of enactment of legislation:

Wagner Labor Relations Act, Wage-Hour Act, and Walsh-Healey Government Contracts Act—Amendment of any of these now extremely remote;

Russell Kent

Water pollution bill—Good prospects for enactment, minus Mundt amendment or with that House compromise substantially modified.

Walter-Logan administrative law bill — Enactment remote;

Regulatory bills—None, unless Securities and Exchange Commission accepts industry's compromise bill for regulation of investment trusts. Cole oil bill cannot pass, even modified. Bill for Federal inspection of coal mines has bare chance, but House subcommittee will not start hearings until late and many wish to be heard.

No tax legislation, no increase in debt limit, no amendments to Neutrality Act or Johnson Act.

Spending has the upper hand in Congress, although the session began with strong gestures toward economy. There are evidences, too, that the President is not adverse to some of the increases.

In appraising the appropriation record of the session, it is important to note that while, at the end, it may be found that total appropriations will not have exceeded the aggregate Budget figure there have been transfers of appropriations into authorizations to execute contracts which obligate appropriations next year, and that there have been other deferred but certain items of future expenditure and that there have been switches in financing from appropriations out of the Treasury to R. F. C. loans.

Contracts authorizations run heavily through the national defense appropriation bills. For instance, a third set of locks is to be constructed for the Panama Canal. The locks will cost an estimated $277,000,000; two-thirds of the original cost of the canal. There is an appropriation of $15,000,000 to start the work, but also there is an authorization to enter into contracts for $99,000,000, and next year there must be an appropriation of $99,000,000 or as much thereof as can be placed under contract for expenditure in a year.

R. F. C. loans will finance in the next fiscal year the loans for Rural Electrification and purchase of farms for tenants—heretofore calling for direct appropriations aggregating, for the two purposes, $65,000,000.

The Administration apparently will win its fight against enactment of the Walter-Logan bill. This measure seeks to require fixed rules by administrative agencies, with the right of an aggrieved person to appeal to the courts as to the reasonableness and constitutionality of rules, and to give the right, as to orders, to appeal first to a Board within the agency and then to the courts which would be empowered to pass upon facts as well as the law. The House passed the measure by the overwhelming majority of 282 to 96, a majority of the Democrats as well as of the Republicans supporting it over objections by Administration leaders.

No Wage Amendments

Senate objections apparently mean no Wagner Act or Wage-Hour amendments, after wild scenes in the House. The Senate-approved amendments to the Walsh-Healey Act are bottled up in an antagonistic House Judiciary Committee.

The Administration won a notable victory when the Senate followed the House and renewed for three years the authority to negotiate reciprocal trade agreements. The Senate fight really ended when the Pittman amendment to regard these pacts as treaties and require Senate confirmation by a two-thirds majority was defeated by three votes. The bill passed, 42 to 37. But on the vote on final passage, Senators from 18 states were solidly for the measure, those from 14 states were divided, and those from 16 states were solidly opposed to it. This tally refers to actual votes, pairs, and announced positions and accounts for the full Senate membership.

Transfer of the Pure Food and Drug Administration from the Department of Agriculture to the Federal Security Agency is provided for in Reorganization Plan No. 4, submitted Congress April 11. The agency will retain its separate identity in the Security Agency, and will not be a part of or subordinate to the Public Health Service, as it was rumored might be the case. The title of the head of the Administration will be "commissioner" instead of "chief" under the terms of the change.

Unless disapproved by a majority vote of both branches of Congress, this Reorganization Plan will become effective June 10. Because the Plan also ordered abolition of the Civil Aeronautics Authority as an independent agency and its transfer to a subordinate position as part of the Department of Commerce, and ordered abolition of the Air Safety Board of the Authority and transfer of its duties to the Authority, a fight is being waged against this Plan. The complete independence of the Air Safety Board, even from the Civil Aeronautics Authority of which it was a part, was one of the main fights in creating the C. A. A.

Reorganization Plans

Senator McCarran, of Nevada, and Representative Lea, of California, introduced resolutions for congressional disapproval of Plan 4. Senator McCarran also introduced a resolution to disapprove Plan 3, which rearranged agencies within departments and was submitted a week previously, because it made a slight change in the Air Safety Board. Indications are, however, these resolutions will fail, and that the Plan will become effective in June. If one part of the Plan be disapproved, the entire Plan is disapproved.

There is even less chance for congressional disapproval of Plan 3. As part of that order, the Federal Alcohol Administration is to be merged with the Alcohol Tax Unit of the Bureau of Internal Revenue with results upon procedure which cannot be forecast until what changes in personnel, if any, are to be made. This is a merger, as distinct from mere reassignment as in the case of the Pure Food and Drug Administration.

Great attention is being given the decision of the Supreme Court April 29 upholding the order of the Public Contracts Board in the "little steel" case under the Walsh-Healey Act. Secretary Perkins fixed a minimum wage of 62½ cents an hour for a group of steel mills, so far as concerns execution of government contracts. Seven companies appealed to the courts attacking the decision on the ground the Secretary had disregarded the law which says that wages shall be those prevailing in the "locality." Their position was that the Secretary had stretched "locality" to include a geographical "region." The trial court held for the Secretary; the appeals court held for the

companies. The Supreme Court held for the Secretary, in effect, but did so by saying that Congress had laid down the law and the courts should not interfere with an administrative agency.

Both sides in the Walter-Logan bill fight claimed the decision helped their cause, opponents of that measure saying it demonstrated Supreme Court opinion that administrative agencies could not be hampered by court appeals if the complex machinery of government is to function, while proponents said it showed the necessity of establishing a law which would make clear the duty of the courts to act in cases of administrative excesses or injustices.

Hearing on the subject of establishing a minimum government-contract wage for the Chemical and Related Products Industry was held April 11, with briefs submitted in early May. It may be weeks, even months, before a decision is reached.

Testifying at the hearing were W. N. Watson, secretary of The Chemical Alliance, Inc.; H. C. Fuller, representing the National Association of Insecticide & Disinfectant Manufacturers; Weir Mitchell, speaking for the R. M. Hollingshead Corporation, Camden, N. J.; and Boris Shiskin, for the American Federation of Labor.

For the Alliance, Mr. Watson stressed the overlapping character of the classification for which the hearing sought to inquire into a minimum wage. He pointed out that minimum wages have been proclaimed for the Fertilizer Industry, 30 cents in the South, 40 cents in the North and 50 cents in the West; that for the Drug Industry a uniform minimum of 37½ cents an hour was fixed; for the Explosives Industry a minimum of 57½ cents was set; for the Soap Industry, a minimum of 40 cents an hour. There is no fine distinction in the industry, taken as a whole, he emphasized, by which plants may be grouped definitely. In any event, Mr. Watson testified, government purchases of "chemicals and related products" are not an important factor, being less than one-fourth of 1 per cent. of the value of production in 1937.

Both branches of Congress have extended the life of the Joint Committee to Study Phosphate and Potash Resources until next January. The committee has about $5,000 remaining and plans a few more hearings, then a final report.

While Congress accepted without demur a change in front by the Administration by which latest-model airplanes were released for British-French purchase, thus representing a retreat from early-session isolationism, there is no move to legalize credits to the Allies. There has been talk in that direction but nothing will be done until after the November election, if then.

In fact, when the Administration presented its bill to legalize a Presidential order "freezing" Danish and Norwegian securities and other credits held in this country by requiring license for transactions so that no question of ownership might arise subsequently, it proposed an amendment to the original draft specifically stating that the law should not be constructed to amend the Neutrality Act, which requires sales to belligerents to be for cash, or the Johnson Act, which forbids credits to foreign governments which are in default in obligations owed the United States government.

But the drift in Washington distinctly is toward extending aid to the Allies by measures "short of war." The Allies do not need Government credits now; what they need is supplies, and quickly, and indications are that war orders very soon will be felt considerably in lines outside the aircraft industry.

M.C.A. to Meet June 6-7

Members of the Manufacturing Chemists' Association will gather June 6 at Skytop Lodge, Skytop, Pa., for the 68th annual meeting. Lammot du Pont, president of the Manufacturing Chemists' Association, will preside at the business session which will be held at 10 A. M. Thursday, June 6. On the following day the annual golf tournament will be held.

Included in the list of speakers at the business session are:—J. Anton de Haas, Professor of International Relationships, Harvard Graduate School of Business Administration, who will discuss "The Problems of Economic Adjustment from the European War," and James S. Thomas, president of Chrysler Engineering Corp., whose subject will be "Culture and the Market Place."

The M. C. A. will act as host to the Synthetic Organic Chemical Manufacturers' Association at the Union Dinner on Thursday evening, June 6, at which Harold G. Moulton, president of the Brookings Institute will be the speaker. His topic will be "Is Further Capital Expansion Possible."

Reservations should be made as far as possible in advance for the capacity of Skytop Lodge is limited, and should be sent to Warren N. Watson, M. C. A. secretary, 608 Woodward Bldg., Washington, D. C.

Offers Summer Course

M. I. T. is offering '40 summer course in Theoretical and Applied Chemistry and Physics of Matter in the Colloidal State, supervised by Dr. Ernst A. Hauser.

Dr. William J. Hale, well-known consultant and exponent of farm chemurgy, admires wedding ring just placed on the finger of his charming daughter Ruth by the groom, Mr. Wiley T. Buchanan. Nuptials took place in Midland last month.

Personalities in Chemistry

By ADMcFadyen

DR. Leo Hendrick Baekeland is noted for his important contributions to chemical engineering, industry and education. For half a century he has been active in the classroom on both sides of the Atlantic. Columbia University proudly lists Dr. Baekeland on its staff as "Honorary Professor of Chemical Engineering." He was the founder of the Bakelite Corporation, and served as president of the corporation from 1910 to 1939. Best known of his contributions to the chemical industries are Velox photographic paper and the Bakelite synthetic resinoid materials.

Dr. Baekeland was born in Ghent, Belgium, November 14, 1863, and received his early education in the public schools there, where he gained a scholarship by which he entered as pupil of the Royal Athenaeum. He graduated at the University of Ghent as B.S. in 1883, and D.Nat.Sc. (Maxima cum laude) in 1884, where he was a fellow student of the now famous writer and philosopher, Maurice Maeterlinck. As an undergraduate at the University, he obtained the government position of lecture assistant in chemistry. After receiving the Doctorate, he became Professor of chemistry and physics at the Government Higher Normal School of Science, Bruges, Belgium, later Assistant, then Associate Professor of Chemistry at the University of Ghent. In 1887, he was awarded first prize, Laureate, in a three-yearly competition among alumni of the four Belgian universities, and became thus recipient of a traveling fellowship which permitted his to visit French, German, and British universities.

Becomes Research Chemist

In 1889 he visited America, and on this occasion accepted a position as research chemist with the firm A. & H. T. Anthony & Co., later known as Ansco Company, now the Agfa Ansco Corporation. His work in this new position was particularly in the manufacture of photographic papers, films, and processes; a subject in which he had been much interested since student days at Ghent. In 1893 he founded the Nepera Chemical Company, in Yonkers, New York, for the manufacture of photographic papers, of his invention. Among the several products of this company, the most successful was Velox paper. The latter started a new epoch in photographic printing. This type of paper utilizes a special colloidal chloride of silver which is relatively non-

Leo Hendrick Baekeland

sensitive to yellowish and greenish light, but much more sensitive to blue and violet rays. Hence it can be exposed and developed very rapidly and conveniently, using the same source of light. This process under various names has now universally supplanted the former slow and uncertain method of sun printing followed by "toning."

In 1899, after making a commercial success of this enterprise, Baekeland sold his interests to the Eastman Kodak Company, in order that he might devote himself freely again to chemical research in his private laboratory in Yonkers. His work now embraced a variety of projects in divergent fields of chemistry. These included electrochemical subjects as well as organic synthesis. In 1904, he began acting as consulting chemist for the Hooker Electrochemical Company of Niagara Falls, New York, and was associated with Clinton Paul Townsend and Elmer A. Sperry in the development of the Townsend electrolytic cell, to the period of the construction and operation of the first full scale works.

In 1905, Dr. Baekeland undertook a new line of research which resulted in his invention of Bakelite synthetic phenolic resinoids obtained by action of phenols upon aldehydes. In the latter part of the Nineteenth Century, it had been known that aldehydes and phenols may unite to form widely varying products, which are radically different from either of the initial components. The earlier investigators, however, had been seeking a substitute for the natural resins, such as amber, copal, and shellac. Baekeland's synthetic product resembled shellac or amber in color and appearance, but was otherwise so radically different that it formed the basis for entirely new industries. Here was a "super-resin" which Nature has not furnished (for it was not mined from the earth, nor gathered from vegetation, but had been created through molecular synthesis in the research laboratory). This invention is considered Baekeland's leading work; so broadly useful have resinoids of the Bakelite type become in nearly every phase of human activity.

Stimulated Chemists

The publication of Dr. Baekeland's work in 1909 stimulated chemists all over the civilized world to further research in this newly opened field of synthetic resins, and thus heralded the present era of synthetic resins and plastics. The multitude of new and useful resins and plastics that have followed but emphasize the basic magnitude of the Baekeland teachings.

Probably no other chemist has been awarded more honors than has Leo Hendrick Baekeland. He has been awarded nine medals, as well as honorary membership in most of the recognized chemical organizations of the world. He has served as president of many organizations including the American Chemical Society, Electrochemical Society, and Chemists' Club. He has served also on the United States Nitrate Committee, National Research Council, Naval Consulting Board, and the Federal Advisory Committee on Chemistry.

J. Sam Guy Honored

Dr. J. Sam Guy, chemistry professor, Emory University, Atlanta, has been named to receive '40 Herty Award, presented annually by Georgia State College for Women's chemistry club. Award was established in '33 in honor of Dr. Charles H. Herty, who developed process of making paper from pine pulp.

HEAVY CHEMICALS

Bichromate Export Quotations Off

No Signs as Yet of any Sizable Seasonable Increase in Demand for Industrial Chemicals—April Volume Considerably Ahead of Same Month a Year Ago—Price Cutting in Arsenate of Lead

STATISTICIANS who forecast business trends for two major heavy chemical producers are at variance regarding summer cycle. One group sees downward curve moving right through hot months with upturn coming after Labor Day. Other school predicts contra-seasonal summer business with pick-up starting at beginning of third quarter.

These curves are plotted on normal conditions, of course, taking into account only trends in domestic industrial activity. Should things start in a big way on the other side, these figures no doubt would be useless.

April business was slow in comparison to first quarter. Still one factor claims rate of buying keeps shipments 15 to 20 per cent. ahead of last year, according to a personal estimate. Figures are not complete on April as yet, and estimate is based on first four months' volume.

Tight situation remains in oxalic acid. Export prices for bichromates dropped sharply, although there still remains a wide spread between the domestic contract price and what "second-hands" are quoting for export.

Arsenate of lead has been suffering from price cutting. Other agricultural items have not begun to move seasonally as yet. Weather is considered retarding factor.

Export inquiries diminished during period under review. How much of this was due to stabilization of brokerage business, how much to slackening in demand, remained problematical. It has been well known for months that brokers are picking up one order and covering the market until it seems that there are ten orders where actually there is only one. Feeling is that this condition is abating somewhat.

"I feel the time has come when we can look for a high mortality rate in that field," is one comment picked up regarding newly organized "desk space" brokerages.

Re-entry of England into export market has hurt, of course. One example cited deals with bleaches which during last quarter of '39 and beginning of this year, were moving to India in large quantities. Figuring in freight, best estimate is that material cost 6 cents to the consumer. England is laying down material at same ports for 3 cents.

From another factor comes the report that British sodium sulfate is reaching West Indies and Peru below normal selling price. While necessity to build up exchange is understandable (bills are reported to call for payment in dollars) another school of thought considers it a desperate attempt to hold markets at all costs.

Scandinavian markets now closed affect agricultural items most seriously. Denmark was a good buyer, but present season finds no inquiry in local market. Formic acid, moving to Dutch East Indies in major quantities recently, has halted. This business featured April export picture of one producer. But future inquiries have not come through, which probably can be traced to jitters aroused by talk of German invasion of Holland, with possible repercussions in Pacific.

Sugar Grinding Takes Acid

South American sugar grinding season which calls for nice quantities of acids moving to Sugar Centrals is now completed. Season usually runs from Nov. 1, to May.

Summed up, April business can be described as "Slow but last year was slower still."

CHEMICAL SPECIALTY News!

N.A.I.D.M. Announces Details of Program for Summer Meeting at Lake Wawasee, June 17-19—Gothard Heads Convention Committee

THE National Association of Insecticide and Disinfectant Manufacturers will hold its 26th annual meeting on June 17, 18, and 19 at the Spink-Wawasee, Lake Wawasee, Indiana. According to the present plans, mornings will be given over to the business sessions and the afternoons set aside for group conferences, committee meetings, and sports. The regular meeting will be preceded by a gathering of the Board of Governors on Sunday, June 16. The general convention committee is headed by N. J. Gothard of Sinclair Refining Co.

According to Preston B. Heller of B. Heller & Co., Chicago, Chairman of the program committee, the speakers will include W. W. Davis, project engineer of the United States Air Lines, on "Sanitation in Air Transportation"; Harry Garrett, Chief, Chicago office of the Food and Drug Administration on "Cooperation between Enforcement Officers and Manufacturers"; George Payne, U. S. Department of Commerce, on "Exporting of Insecticides and Disinfectants"; Dr. Craig Eagleson of the Department of Agriculture on "Recent Research in Livestock Sprays"; Dr. H. Ulvin, Chief Chemist, Sidney Wanzer & Sons Dairy Co., on "Sanitation Control in Dairy Operation."

A moving picture on "Insect Control" will be shown by Henry Turrie of Wil-Kil, Inc., Milwaukee. Other reports and speakers will also be heard.

The mid-year informal dinner will be held on Tuesday evening, June 18, at the Hotel, accompanied by a floor show.

The annual Golf Tournament will be held on Monday afternoon.

J. L. Brenn of the Huntington Laboratories, Huntington, Ind., is in charge of general hotel arrangements. According to Mr. Brenn reservations should be made promptly through the office of the association.

A.S.T.M. Committee Holds Meeting

The Special Committee for Testing of Textile Finishes held its Annual Meeting on Wednesday, May 8, at the Industrial Building of the National Bureau of Standards in Washington, D. C. The purpose of this meeting was to review the accomplishments of the first year.

This Special Committee is sponsored by Committee D-13 on Textile Materials of the A.S.T.M. Its purpose is to develop instruments and methods for the physical evolution of textile materials.

Appointed Sales Manager

V. L. (Vic.) Roberson has been appointed Sales Manager of the specialties division by Penn. Refining, Butler, Pa.

Hall Honored

Frank Griswold Hall, president Stein, Hall & Co., Inc., was tendered a banquet by officers, directors, upon completion of 50 years' service with the company.

Plans New Exposition

The Chicago section of the American Chemical Society has undertaken to sponsor an exposition of chemistry and chemical industry, it is announced from Chicago. The exposition is to be known as the National Chemical Exposition. Plans are under way to make the new venture not only the most comprehensive and diversified of the kind ever held in America, but to provide a program that will be attractive and interesting for the thousands who attend.

The Exposition Hall of the Stevens Hotel will house the show from Dec. 11 to 15, 1940.

A committee of ten, headed by R. C. Newton, has perfected plans which have been approved by the board of directors of the Chicago section.

The exposition is designed to present the science of chemistry in a great many of its aspects and to show the applications that play such a large and increasing part in modern industrial activity. Although emphasis will be placed on the display of new products and chemicals, scientific exhibits and equipment will be included.

Dr. Newton has said, "It is estimated that approximately 40,000 chemists, chemical engineers, production managers, plant superintendents, buyers and company executives will pass through the exhibits. We expect to provide and assign booths to some 300 exhibitors. It is hoped that there will be space for all who apply."

The Exposition Committee working with Dr. Newton consists of V. Conquest, Armour and Co., E. H. Harvey, Consulting Chemist, L. M. Henderson, Pure Oil Co., W. M. Hinman, Frederick Post Co., R. H. Manley, Research Foundation of Armour Institute, L. E. May, Sherwin-Williams Co., G. L. Parkhurst Standard Oil Co. (Ind.), A. E. Schaar, Schaar & Co., R. E. Zinn, Victor Chemical Works.

An advisory committee of outstanding personalities in the industry has been secured to obtain the benefits of valuable counsel and experience.

Tuxedo white shoe cleaner and Tuxedo white shoe soap are being offered exclusively to retail shoe stores, shoe chains and footwear sections of department stores by the Shoe Polish Division, of Hecker Products Corp., New York.

Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

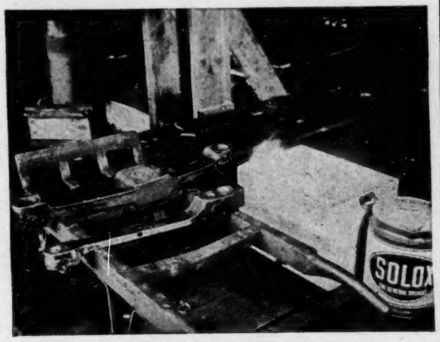
May ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1940

Shrink Fits With Solox and "Dry-Ice" Utilized on Motors

End Risk of Aero-Engine Failure From Loose Valve Seat Rings

Greatly improved fits for valve seat rings on airplane engines, with less risk of engine failure, are reported to result from chilling the parts with a solution of "Dry-Ice"* and Solox.

The rings are machined, hardened and ground with a tolerance of .004", and then placed in a bath of the Solox and "Dry-Ice,"



Bushings in these locomotive parts are inserted by using Solox and "Dry-Ice" to chill and contract the bushings below the fit size.

which chills them until they are reduced below the fit size. The cylinder block receives a steam bath to expand the holes slightly, and the rings are inserted in the block.

When rings and block regain normal tem-

*Manufactured and supplied by Pure Carbonic, Incorporated, an associated Company of U.S.I.

(*Continued on next page*)

Betters Paint Quality by Upping PbO:PbSO₄ Ratio

LAKEWOOD, Ohio — More durable paint films result when basic lead is introduced into drying oil vehicle paints in the form of basic lead sulphates having a $PbO:PbSO_4$ ratio of at least 2:1, it is claimed in a patent granted to an inventor here.

The improved quality of the paint film is said to arise from the formation of lead-oil soaps, which increase consistency and aid in forming a film with greater elasticity, lower permeability to water, and reduced rate of destructive oxidation.

Finds Actinic Rays Speed Organic Acid Formation

MIDLAND, Mich.—That the synthesis of organic acids from primary alcohols or aldehydes in the presence of a catalyst can be accelerated by actinic rays is claimed in a patent granted to an inventor here.

According to the inventor, experiments in the formation of acetic acid from a mixture of ethyl alcohol and water showed that irradiation with actinic rays gave a slightly higher yield with a catalytic mass only one-half to one-fourth as large as was needed when the actinic rays were not employed.

Ethyl Alcohol is produced by U.S.I.

Improved Dehydration Processes Open New Fields for Castor Oil

Product Offers Interesting Possibilities as Replacement For Tung Oil in Typical Paint and Varnish Formulations

Dehydrated castor oil, now produced by a method that gives 100% dehydration, is displaying excellent potentialities as a drying oil for use in the manufacture of quick drying paint and varnish, it is reported.

Characterized in its ordinary state by an iodine number of about 85, and hence classed as a non-drying oil, castor oil when subjected to the dehydration process develops good drying oil characteristics, which allow it to be used in replacing tung oil.

Compared with other tung oil substitutes, dehydrated castor oil appears to have definite advantages. It dries more quickly than perilla

The castor plant is among the newest of drying oil sources. Plant height ranges up to 35 feet.

or linseed oil and forms a more durable and waterproof film, it is claimed. A further reported advantage of dehydrated castor oil is that it does not turn yellow with age.

Double Bonds

Until very recently, it was supposed that the dehydration process gave a high proportion of conjugated double bonds (conjugated diene structure), but recent work has shown that only about 25% of the molecules of the dehydrated ricinoleic acid contain the conju-

(*Continued on next page*)

New Name—Same Policy

In keeping with the constant broadening of U.S.I.'s scope of service to industry, SOLVENT NEWS appears for the first time this month under a new name — U. S. I. CHEMICAL NEWS. The editorial policy remains unchanged — to bring you every month news of the latest developments in the fields of solvents and chemicals, and of the industries that consume them.

Make Paints That Resist Water, Fire, and Mildew

BALTIMORE, Md.—How strongly adhesive paints that resist water, fire, and mildew can be formulated with zinc borate is revealed in a patent granted to two inventors here.

The paints, it is claimed, may be applied on iron and steel, wood, cardboard, and various types of wall board, and have marked affinity for galvanized iron.

A typical coating, it is said, has the following proportions:

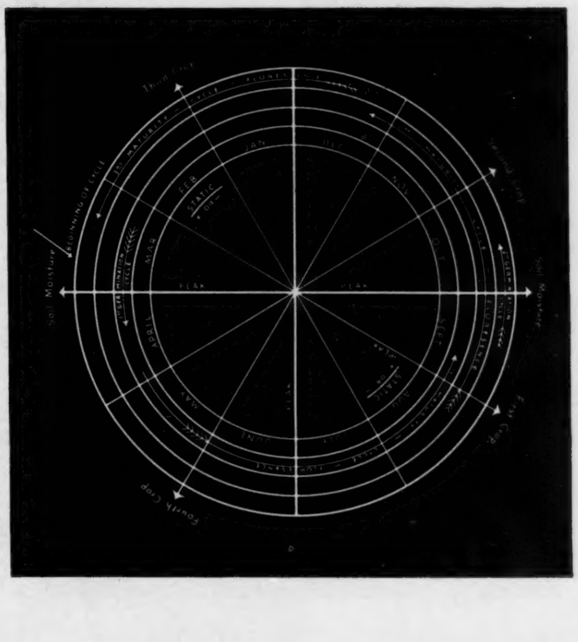
Chlorinated paraffine	16.8%
Chlorinated rubber	6.0%
Tricresyl phosphate	1.2%
Pigment and filler	21.6%
Zinc Borate	14.4%
Solvent	40.0%

Suitable solvents include ethyl acetate and chlorinated hydrocarbon solvents.

A modification using Paris green is said to have excellent anti-fouling properties.

Ethyl Acetate is produced by U.S.I.

The castor plant grows both wild and cultivated in tropical regions. Until very recently the beans used in this country were all imported from Brazil. In order to provide a domestic source of supply, Woburn, Incorporated, began raising castor plants in Texas and Florida. As indicated by this chart, the castor plant is rapid-growing. Time required from sowing to harvesting is so short that three to four crops can be obtained in a single year. The castor plant displays marked variations in size, ranging in height from 6 to 35 feet. Considerable variation is also noted in the dimensions and color of the seeds. The oil from the castor beans possesses good drying oil properties after it has been dehydrated, and is currently attracting considerable interest among manufacturers of paints and varnishes as a means of replacing tung oil, which is now difficult to obtain.



May ★ **U.S.I. CHEMICAL NEWS** ★ 1940

Greaseproofs Paper, Cloth With Aid of Ethyl Alcohol

LA GRANGE, Ill. — That greaseproofing compounds for the treatment of paper, cloth, and other fibrous bodies can be prepared with the aid of ethyl alcohol is revealed in a patent granted to an inventor here.

A typical formula, it is said, has the following proportions by weight:

	Parts
Dry zein	100
92% ethyl alcohol	300
Urea	20
Propylene glycol	30

The propylene glycol, it is claimed, has a stabilizing effect, counteracting the tendency of urea to insolubilize the zein. Although other zein solvents can be substituted for the ethyl alcohol, the alcohol is preferred, according to the patent.

Ethyl Alcohol is produced by U.S.I.

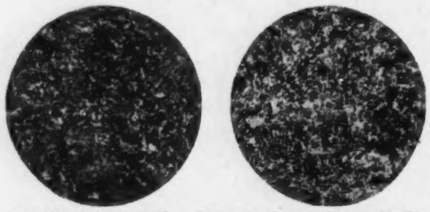
Shrink Fits With "Dry-Ice"

(Continued from previous page)

perature, the rings fit with uniform tightness throughout the entire length of the holes, it is said, since they are fitted in holes which are not distorted. It is reported to be impossible to achieve such uniform fits with the hydraulic press method previously employed.

Microscopic examination of steel which has been chilled by this method shows that no change occurs in the grain size, and that the metal is not softened in the process.

Solox, U.S.I.'s proprietary alcohol-type sol-



(Left) Micrograph of a steel specimen in its original state. (Right) The same specimen after chilling to —60°F, and allowing it to rise to room temperature. Note that no change occurs in the grain size.

vent, is considered to be ideal for this purpose because it can be used in confined places, is low in cost and is available for manufacturing purposes with only minor restrictions.

The method is applicable to the fitting of other parts, such as axles, bushings, crank pins, and wrist pins. A special bulletin, giving details on the use of Solox and "Dry-Ice" in shrink fits, is available without charge from U.S.I. Ask for Bulletin No. 63.

Stocks Streams with Fish Put to Sleep with Urethane

MONTREAL, P. Q.—Novel use for urethane in stocking lakes and streams with fish is proposed by a scientist here.

The idea is to keep the fish alive and unharmed out of water for a long enough time to transport them to their new home. Putting them in a urethane solution for a minute or two turns the trick, says the scientist. The fish promptly fall into a "twilight sleep" that lasts for as much as ten hours, and revive in the water.

Urethane is produced by U.S.I.

Dehydrated Castor Oil

(Continued from previous page)

gated double bonds desirable in a drying oil. Current research is being devoted to the problem of suppressing the formation of the isolated double bonds. When that problem is solved, a true substitute for tung oil will be available. In the meantime, the dehydrated castor oil now commercially available has so many valuable properties that it is likely that its use will be continued even if a process for making a true tung oil substitute is discovered.

Typical Formulations

Possibilities of dehydrated castor oil in typical formulations are indicated by the following varnish formulas, suggested by a leading supplier of the oil:

Formula		
Arochem* 520†	100 lbs.	100 lbs.
Isoline SV‡	6 gals.	none
Isoline Z-3‡	19 gals.	25 gals.
Mineral spirits	36.5 gals.	46 gals.
Driers:		
Lead naphthenate (16%)	3.1 lbs.	3.1 lbs.
Cobalt naphthenate (6%)	0.83 lbs.	0.83 lbs.
Properties		
Non-volatile content	55%	50%
Viscosity (Gardner)	F	F
Color (Hellige Comparator)	2-L	2-L
Lead content (metal on oil)	0.25%	0.25%
Cobalt content (metal on oil)	0.025%	0.025%

*Reg. U. S. Pat. Off.
†Stroock & Wittenberg Resin.
‡Dehydrated castor oil. U.S.I. will refer readers to source of supply.

In addition to its use in paints and varnishes, dehydrated castor oil is expected to find utility in the formulation of printing inks.

Manufacturers of dehydrated castor oil are in a position to offer more detailed information on the use of the product in specific formulations. U.S.I. will refer readers to a source of such information.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A joint seal compound is described as flexible, leak-proof, non-cracking. Maker states that it is completely resistant to propane, gasoline, naphtha, grease, and oil, and can be used on rubber (which it does not attack) as well as on metal fittings. **(No. 330)**

U S I

A portable glossmeter is said to be suitable for checking gloss of samples against specifications and for measuring changes produced by weathering and abrasion. **(No. 331)**

U S I

Permanent marking on glass, wood, metals, paper, plastics, and fabrics is said to be possible with a new marker, which is available in four colors. **(No. 332)**

U S I

Lustrous finishes on rubber, synthetics, and fabrics can be obtained with a new compounded resin solution in alcohol, it is reported. The solution is said to produce films that are unaffected by water, oil, most hydrocarbons: adhere strongly and remain flexible; are practically non-inflammable when dry. **(No. 333)**

U S I

A retinning compound is said to be simple to apply. It is prepared in powdered form, which is mixed with water and painted on with a brush. It is then heated with a blow-torch flame. Maker says it can be applied to all metals except aluminum and lead. **(No. 334)**

U S I

A level indicator for solid materials in bins is said to consist of a miniature electric hoist which lowers a weight to level of material. As weight strikes material, cable is said to slacken, actuating a switch that reverses motor. Level is shown on indicator outside bin. **(No. 335)**

U S I

A new wax is said to have a very high melting point and many of the characteristics of Carnauba wax. Maker recommends it particularly for the manufacture of secondary and one-time carbon paper. **(No. 336)**

U S I

A porcelain-like paint is said to be unaffected by most industrial acids and fumes and to produce high waterproofing properties. It is reported to be suitable for application on exterior or interior surfaces, including cement, brick, stone, plaster board. **(No. 337)**

U S I

A cleaning powder for aluminum is dissolved in water to form a solution that is said to remove dirt and foreign matter without attacking the aluminum. **(No. 338)**

U S I

Rustproofing in colors is a new development that is expected to prove useful as a means of identifying small parts. It is reported that several colors are available. **(No. 339)**

SOLVENTS

Heavy Shipments Continue to Consumers

Speculators Reported Buying Large Quantities of Certain Solvents from Consumers at Attractive Prices for Sale in Export Markets—Seasonal Automobile Production Holds Up Well

BEST news developing in solvents market during last month was to effect that seasonal letdown in automobile production will come thirty days later this year. Forecast comes from reliable source which future picture is available three to six months in advance.

This means that movements of solvents to automobile finish manufacturers will continue at the fine pace maintained during first quarter. No slump is expected until July when usual wait for new model dies arrives. After that business is expected to pick up where it left off.

Size of business can be judged by fact that a company supplying coatings for only one auto maker is reported using 150,000 gallons per month. Akron has also been an active factor in the market. All in all, shipments are brisk, well ahead of last year and moving in an even line. Second quarter in solvents is expected to show no drop when compared with first, reversing trend of most chemicals.

Refined isopropyl alcohol demand increased greatly during past few months; held up well in April. Material is supplanting denatured alcohol in rubbing alcohols, one factor reports, accounting for new demand.

Paint trade has been taking solvents in good quantities. Inventories have been light and shipments steady. Material gets boost from fact that it takes tanks to store solvents. It is frankly admitted that hoarding probably would have developed in this field during final '39 quarter if tanks could be built overnight—and inexpensively.

Acetone Demand Declines

Acetone demand was easier during period under review. While volume ran well ahead of last year, it won't stand contrast with any of first quarter months. This does not, however, mean that you can step into the market and buy spot material. It means merely that inventories of producers are in better position to handle contract shipments. Nothing is reaching the docks from first hands.

Butyl alcohol has found normal support, although buying here was more cautious than first quarter. Methyl ethyl ketone moved to the paint trade in fair quantities.

Exports declined moderately. Scandinavian countries, of course, are out of market. Inquiry seems to be sobering. This is regarded in most quarters as a welcome change, as foreign picture seemed to be out of focus. Indeed, one factor reports that export market might be oversold in spots, a natural result when anxiety over material is felt.

Important Price Changes

ADVANCED

None

DECLINED

	Apr. 29	Apr. 1
Methanol, natural, zone 1	$0.30	$0.33

Shipments are moving to United Kingdom, Spain, and the Far East. It is felt that some of the material reaching Spain is for re-export. Much South American business seems to be caught in exchange muddle, and buying in those markets could be better. Two rates of exchange, one an "official rate" reserved for countries with whom Latins have favorable trade balance (Britain for one), and a so-called "free rate" running as much as 30% higher is reserved for U. S. which sells more than it buys.

Alcohol, Methanol Output Up

Ethyl alcohol produced during March, 1940, amounted to 20,983,157 proof gallons against 17,438,065 gallons for March, 1939, and 20,381,272 gallons last month. Alcohol withdrawn for denaturation was 16,729,801 gallons as against 13,201,578 gallons in March, 1939. At the end of the month stocks in bonded warehouses were 20,676,694 gallons contrasted 27,741,-492 in March, 1939. Production of completely denatured alcohol was 413,609 gallons as compared with 504,865 gallons in March, 1939, and 453,848 in February, 1940.

Production of synthetic methanol during March 1940 was 3,462,946 gallons as against 2,406,564 gallons in 1939, an increase of 44%. However, production declined somewhat from the 3,782,402 gallons produced in February. Production of crude methanol totaled 506,937 in March and 364,500 in the same period last year.

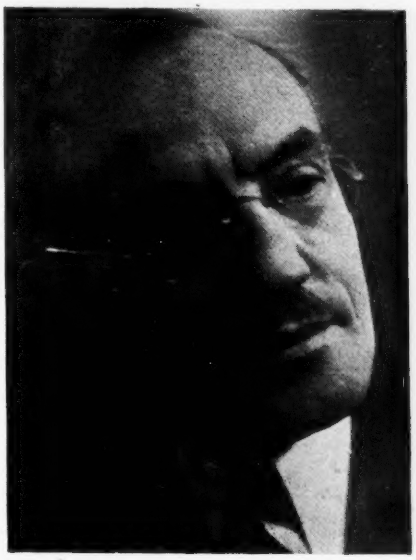
Power Alcohol Again

A new bill to force the use of alcohol in motor fuel has been introduced in the House of Representatives by Rudolph G. Tenerowic, Michigan. This new bill (H. R. 9582) would make it illegal to transport motor fuel in interstate commerce, or to transport persons or property in interstate commerce in vehicles propelled by internal combustion engines, unless the fuel contained certain percentage of alcohol made from domestic agricultural products.

During the first year the amount contained would be 2 per cent. This percentage would be increased 2 per cent. each year for five years when the amount would be 10 per cent.

A.I.C. Medal Award

The medal of The American Institute of Chemists, presented annually for outstanding service to the science and profession of chemistry in America, has been awarded this year to Dr. Gustav Egloff, director of research, Universal Oil Products Company, Chicago, Ill., according to



DR. GUSTAV EGLOFF

To receive new honor at Atlantic City, May 18.

announcement made by President Robert J. Moore. The award is made in recognition not only of Dr. Egloff's work in developing some of the most outstanding processes for the refining and treating of crude oils and gasoline; for his prodigious amount of publications in the field of petroleum and hydrocarbon chemistry, amounting to over four hundred articles and books; for the issuance to him of over two hundred and fifty patents relating to the processing of petroleum, oil, coal, shale oil, and chemical derivatives of hydrocarbons, which are invaluable to the research workers in chemistry, but also for the outstanding service which he has given to the advancement of chemists.

The medal will be presented to Dr. Egloff at the annual meeting of the American Institute of Chemists to be held at Atlantic City, New Jersey, May 18, 1940.

Neoprene Plant Expansion

DuPont is now building addition to Neoprene plant at Deepwater Point, N. J., which will double production when unit is put into operation late this Fall. New uses developed for product is given as reason for expansion.

FINE CHEMICALS

Spring Seasonal Items Now Moving

German Invasion of Norway Forces Cod-Liver Oil Prices Up Sharply—Heavy Pharmaceutical Purchasing for Shipment Abroad Reported—Easier Tone Noted in Quicksilver Market

SPRING finally caught up with seasonal items which held up well during March. Market enjoyed approximately thirty days "borrowed time" due to freak weather. But narcotics and other items used in compounding potions for winter ills are being tucked away until Fall.

Scandinavian invasion has played havoc with cod liver oil. Prices quoted anywhere from $10 to $15 a barrel higher than month ago, and still are nominal in most quarters. No cod liver production is seen in Norway until one side masters all sections of the country. As things stand now, Allies control fishing grounds, but German troops occupy cities where processing plants are located.

As a whole, optimism is keynote among producers of fine chemicals. Latter part of month saw heavier inquiries coming into market, indicating brighter days ahead. Although April was a bit off, business was considered good; well over last year.

Sulfurpyridin moved well, due to new applications for drug. Tartar derivatives enjoyed a steady demand, while mercurials were being bought as needed. Current price situation in latter item has cooled consumers to future purchases.

Positive loss of Norway, Denmark markets and practical isolation of Sweden as far as imports are concerned has made a dent in consuming power that no one is minimizing. All three countries bought raw materials here for conversion into medicinals.

There is but one cheering factor in whole foreign picture, speaking from a business standpoint, of course. This is fact that relief agencies here have been buying up medicinals and pharmaceuticals for shipment abroad. Investigation would reveal this ordering to be stronger than most producers estimate, it was authoritatively stated.

Shipments en route to Scandinavian countries have been recalled in most cases. Highest volume of goods passed to docks through second hands. Foreign consumers have asked that goods be resold here in order to avoid loss all around. However, there is little likelihood of dumping for in many instances special packaging for export was entailed and agents are loath to agree to resale proposition. At least one lawsuit is now in its first stages to force buyer to take the material. Whether this material ever will reach the domestic market under these conditions is problematical.

Important Price Changes

ADVANCED	Apr. 29	Apr. 1
Camphor, natural, powd.	$0.85	$0.83
Camphor, tablets	.90	.88
DECLINED		
Formaldehyde	$0.055	$0.0575
Quicksilver	171.00	183.00

Monsanto in Australia

Monsanto is expanding its activities in Australia with establishment of manufacturing facilities at Melbourne for a group of pharmaceutical products formerly produced only in the United States and Europe.

Verona Names General Drug

The aromatic division of General Drug Co. has been named sole distributor of aromatic chemicals made by Verona Chemical Co., Newark, N. J.

Lindsay Announces Purchase

The Lindsay Light and Chemical Co., Chicago, recently bought the lighting equipment business of the Welsbach Company, Gloucester, N. J.

The Welsbach gas water heater business, land and plant were not included in the transaction.

OBITUARIES

Carl Bosch

Professor Carl Bosch, leader of the German dye industry, died on April 26 at his home in Heidelberg.

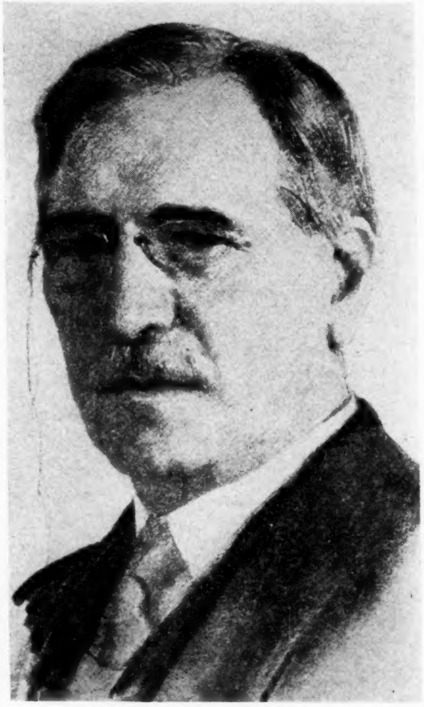
Professor Bosch was born at Cologne, Aug. 27, 1874. He was one of the best known personalities in developments of synthetic chemistry and pioneered in creating chemical substitutes. Among his achievements were the production of synthetic gasoline and synthetic ammonia. For his work on ammonia he was awarded the Nobel Prize in 1931 along with his co-experimenter, Professor Friedrich Bergius.

When the German chemical industry was turned into the German dye trust in 1925 he was made chairman of the board. Ten years later he became president and general director of I. G. Farbenindustrie, as it was known.

Dr. Charles L. Reese

Dr. Charles Lee Reese, 77, former Du Pont Chemical director, and board director of the company, died at Ponte Verde, Fla., where he was passing the winter.

Born in Baltimore, Nov. 4, 1862, Dr. Reese attended Johns Hopkins for a year before transferring to U. of Virginia from which he was graduated in 1884. He then studied chemistry at Universities of Heidelberg and Gottingen, receiving his Ph.D. from Heidelberg in 1886.



Before joining Du Pont in 1902, Dr. Reese taught chemistry at several Southern colleges, leaving the teaching profession to become chief chemist of New Jersey Zinc Company. He was placed in charge of Du Pont's Eastern Laboratory, one of the pioneer industrial research organizations in the country, becoming chemical director in 1911. He retired from this position in 1924, but continued as consultant until 1931. He was elected to the board of directors in 1917.

Dr. Reese was at various times chairman of the board of directors, A.C.S.; president, Manufacturing Chemists' Association; vice-president, International Union of Pure and Applied Chemistry; president, A.I.Ch.E., and founder and chairman of the Board of Industrial Research.

Food Research Laboratories, Inc., has moved to its newly completed laboratory building at 48-14 Thirty-third st., Long Island City, N. Y.

COAL TAR CHEMICALS

Particularly Tight Situation In Toluol

Speculators and Export Factors Offering Fancy Prices to Consumers to Part With Stocks—Nitration Grade Unobtainable—Coke Production Rise Reported in March—Tar Output Higher

CAUTION was buying keynote among consumers of coal tar chemicals during April. Period was off from March, although volume was not alarmingly low. Intermediates and colors were moving at a reduced rate into dyestuffs, textile, automobile industries. Problem seems to be consumer inventories according to one factor.

Toluol continues tight, although prompt shipments are the rule to contract buyers. Spot material is unavailable. Situation is the reverse on benzol. So much so that when small quantities of toluol are available for export, sellers demand that buyers take five gallons of benzol for each gallon of toluol offered.

One major producer complained of broker activity as upsetting factor in toluol market. Later part of month found one agent broadcasting price of 45 cents a gallon in tank lots, at a time when material was selling to domestic consumers at 26½ cents. The offer went begging. If there is any proof needed of lack of "profiteer psychology" in chemicals, this example should do until a better one comes along.

Xylol could be found in quantities to take advantage of all orders. This went for export as well as domestic. But there wasn't too much interest in the item evidenced by consumers.

Cresylic borrowed strength from lack of imports, although buying was lackadaisical. Tar acids, cresols, and phenol shipments were fair, with export inquiry developing on phenol as month played out. February exports of this material amounted to 319,015 lbs., with a dollar value of $49,836, with United Kingdom and Belgium accounting for two-thirds of it.

Important Price Changes

ADVANCED	Apr. 29	Apr. 1
Naphthalene, refined, balls or flakes	$0.07	$0.06¾
DECLINED		
Naphthalene, crude, imp.	$2.90	$3.00

March coke production increased 2 per cent. over February, reaching a total of 4,259,848 tons, according to Bureau of Mines. By-product coke ovens produced 4,124,748 tons, an increase of 3 per cent. Production was carried on at 83 plants, 79 of which made ammonia and 56 made benzol.

Stocks of by-product coke dropped 67,387 tons during March. On April 1, stores were set at 1,638,487 tons.

Light oil recovery rose to 16,672,441 gallons during March, higher by 439,339 gals. than previous month, while during March '39, only 13,884,616 gals. were recovered. First quarter output totaled 50,335,426 gals. which compares with 39,899,937 gals. in same '39 period.

Tar output for March was 50,541,981 gals., compared with 49,210,039 in February and 42,090,777 gals. in March '39. First quarter figures on this item were 141,540,610 gals., against 120,955,404 in '39 quarter.

New Colors Added to List

New Coal Tar Color designated "D & C Red No. 38" has been added to list of colors found suitable and harmless for use in cosmetics, drugs by Department of Agriculture. Regulations also fixed 1/10th of 1% benzoate of soda as preservative which may be used in liquid coal-tar color mixtures.

New Construction

Sandoz Chemical Works, Inc., has awarded contract for construction of $20,000 addition to its plant at Charlotte.

General Aniline plans erection of addition to Elizabeth, N. J., plant, to cost $33,000.

Consolidated Chemical Industries, Inc., will build a warehouse near Manchester terminal, Houston, Tex. The Austin Company is contractor.

To Address Salesmen

Dr. R. M. Burns, Assistant Chemical Director, Bell Telephone Labs., will discuss "Chemistry in the Telephone Industry" at the May 14 luncheon of the Salesmen's Association of the American Chemical Industry being held at the N. Y. Chemists' Club. Salesmen will golf on June 18 at Green Meadow Club, Harrison, N. Y.; July 16, Canoe Brook Country Club, Summit, N. J.; August 20, Bonnie Briar Country Club, Larchmont, N. Y.; and September 17, Pomonok Golf Club, Flushing, L. I.

Electrochemical Day at Fair

Dr. Francis J. Norton, Yale graduate and prominent research chemist and physicist, will be the chief speaker May 25 at "Electrochemical Society Day" at the World's Fair of 1940 in New York. More than 1,000 members of the society will attend a luncheon and special program at the Gas Exhibits Building.

Marketing of Chemicals

Walter J. Murphy, Editor, CHEMICAL INDUSTRIES, discussed "Trends in Marketing of Chemicals Over the Past 25 Years," before the graduate students of Columbia's course in "Chemical Engineering Economics" on April 22.

Chemical Industries drops in for a visit at the Wm. Lynn Chemical Company, progressive Mid-West industrial chemical distributors with headquarters at Indianapolis. Left to right, E. T. Shaneberger, president and general manager; Fred A. Conkle, recently appointed sales manager; W. D. Roeller, Dow Chemical, who was also visiting; Carl Hulen, office manager.

RAW MATERIALS

Further Declines Reported in Chinawood

Buying in Natural Raw Materials Chiefly Limited to Small Replacement Lots—Local Stocks of Carnauba Still Small—Further Declines Reported in Naval Stores—Stearic Acid Lower

Important Price Changes

	Apr. 29	Apr. 1
ADVANCED		
Candelilla wax	$0.18½	$0.18
Carnauba wax	.64	.51½
Oil, olive, denat.	.95	.94
Tallow, extra, loose	.04⅞	.04¾
DECLINED		
Oil, Chinawood	$0.22½	$0.25½
Oil, Menhaden	.32	.34
Oil, Neatsfoot	.17	.17½
Oil, Oiticica	.18	.19
Rosin, gum	5.10	6.10
Stearic acid		
Double pressed	.10½	.11¼
Triple pressed	.13¼	.14
Turpentine, N. Y.	.33¼	.36½

THERE was no outstanding broadening of business in the raw materials market during April. Purchasing of fats, oils and greases was more or less limited to small quantities for prompt shipment.

In first part of month cottonseed oil and lard futures turned upward a bit because of extension of war to Scandinavia but dropped again towards close of month.

New business in soybean market was quieter. Tone was generally firm with steady movement on contracts. The Bureau of the Census has reported a first-quarter crush of 500,451 tons of soybeans and production of 155,468,263 pounds of oil. These figures compare with 397,347 tons of beans crushed and 121,929,606 pounds of oil produced for corresponding quarter in 1939. In spite of large production this year stocks of oil are lower, 19,086,294 compared with 32,644,636.

The Bureau of Agricultural Economics, as a result of a survey, has stated that if war in Europe is prolonged until after next crop marketing period, ocean shipping costs will be so high that domestic fats and oils will find favor.

Chinawood oil situation continued easy in absence of improvement in trade. Although there was some shading, the leading sellers held to previous basis.

Tung oil trading in China was more active throughout March than for several preceding months, with about 373 short tons changing hands. Influenced by export activity, prices of oil rose from .091 to .121 cents per pound during March. There were no arrivals of tung oil at Hankow from upcountry. Stocks on hand at Hankow were reported to be about 3,567 short tons, 1,400 of which were held by Japanese firms and not available for resale.

An interesting development occurred in the wax situation when a French battle ship apprehended Norwegian steamer, *Bajamar*, out of Brazil for New York with large shipment of very much needed Carnauba wax. The crisis was relieved when French authorities ordered release of vessel. However, supplies are still scarce and prices are progressively higher.

No great change took place in naval stores situation during April. In first part of month rosin quotations had downward trend. This easier situation being caused by increase in offerings at Savannah, where receipts showed some expansion.

The most important feature of the situation was announcement, on April 11, from Washington that all government offerings of turpentine and rosin would be withdrawn. The order became effective April 15 and is to continue indefinitely. This surprise action was felt by some to be an effort to check downward trend in primary market. Tone of market did show some improvement after announcement. There were reports of inquiries from South America and Far East but actual takings were small. Little hope is held for improvement in European shipments. Toward end of month weather conditions in producing area were not favorable and receipts were small.

Phillips & Jacobs 75 Years Old

Phillips & Jacobs, manufacturer, distributor of industrial chemicals, is celebrating 75th business anniversary. Firm was founded by George Phillips and H. S. Jacobs in 1865.

125th Anniversary

Arnold, Hoffman & Co., Inc., is now celebrating 125th anniversary. It is the oldest chemical house in New England.

A.I.Ch.E. Awards

Howard Campbell, a senior in chemical engineering at McGill University, was declared the winner of the A. McLaren White Award, the highest student prize granted by the American Institute of Chemical Engineers.

Wins Zeisberg Award

Percy J. Cotty of Wilmington, a student at the University of Delaware, is the winner of the first prize in the F. C. Zeisberg Award of the Philadelphia-Wilmington Section of the American Institute of Chemical Engineers, it was announced recently by F. C. Mitchell, Chairman of the Section.

Below, center, new warehouse and offices of the well-known St. Louis chemical distributor, G. S. Robins & Company. Left and right, the two large and well-equipped wings of the warehouse. New location at 126 Chouteau Avenue provides 72,000 sq. ft. and carloading facilities for eight cars at one time. Above, H. L. Dahm, president of the firm since the death of George S. Robins. Two of Mr. Robins' sons are officers, G. K. Robins, secretary, and B. A. Robins, treasurer. E. S. Weil is vice-president, and M. P. Heeter is assistant treasurer.

PIGMENTS AND FILLERS

April Volume Shows Seasonal Gain

Good Export Demand for Certain Pigments—Decline in Carbon Black Shipments—Price Cutting Continues in Several Colors—Casein Prices Weak—First Quarter Lacquer Sales Up

MAY could be a great month in the pigment field—it all depends on the weather. Outdoor paint activity hinges on arrival of dry Spring weather, lack of which has been holding many a dollar out of the pockets of producers. Fear now is that season will go from winter to summer, with hot weather killing the outdoor season entirely.

Business in the field has been normal, during April, exports helping considerably. If, added to this, paint trade finally wakes up, May should bring fulsome cries of joy from pigment and color suppliers. One thought picked up in an allied field lays current slack in paint industry to inventories. It is pointed out that pigments can be stored readily. Answer to current lag can be found in orders placed during November and December.

South America has been taking material in good quantities. Hopes are entertained that it will prove lasting business. England's share in the market while not eliminated, has been considerably curtailed because of shipping difficulties. Domestic producers feel quality of U. S. material will grow on S. A. consumers and the motto seems to be "treat 'em right." One factor believes that a trade agreement might sweeten this market.

Carbon black shows no signs of reduced activity. Akron tire manufacturers are taking material at same rate as during first quarter. Automobile production continuing in strength has also helped. Interesting note injected into April picture is fact that English tire plants have not been in market for carbon black, giving rise to conjecture as to what happened. One guess is that factories have been converted into war industries plants.

Titanium shipments were accelerated during period under review. Charts on this item now show advance over each preceding month with April topping volume of first quarter periods.

Colors still suffer from price cutting. Inside offers have reached a point where it is doubted that producers are even trading dollar for dollar with their customers. This unbusinesslike situation is expected to outlast current quarter. No change is looked for, in informed circles, until summer—if then.

Casein is still weak, although quotations have taken on a firmer tone. Paper mill activity is considered cause for stiffening of market. Some factors doubt seriously though that prices would hold in the face of definite quantity business. New yield, reported heavy, is likely to complicate this picture further.

Important Price Changes

	Apr. 29	Apr. 1
ADVANCED		
Aluminum powder		
Extra fine	$0.92	$0.91
Standard	.57	.56
Film scrap	.13	.12½
DECLINED		
Casein	$0.09½	$0.10

Zinc oxides received impetus from rubber orders, although some movement to paint trade was noted. Lead derivatives were only fair. Lithopones maintaining a strong, steady volume, to both domestic and foreign consumers could be classed among leading performers for April.

March Paint Sales Show Gain

Combined sales of paint, varnish, lacquer, and fillers during March show an increase over February. Total sales for March, as reported by 680 manufacturing establishments, were $31,592,093 as compared with $26,537,573 for February, 1940, and $32,888,357 for March, 1939.

Sales of plastic paints were valued at $54,603 against $42,993 and $44,198 last month and last year respectively.

Cold water paints sales were $506,425 compared with $396,738 for February, 1940, and $502,974 for March, 1939.

Among those who signed Chemical Industries' Guest Book last month was genial Charles J. O'Connor, executive vice-president, Reichhold Chemicals, prominent manufacturer synthetic resins, plastics, dry colors and chemicals.

The first quarter sales of lacquer released by the Bureau of the Census show total of $13,416,114. This is a gain of about 10% over first quarter of 1939 and a decrease of about 7.5% from last quarter of 1940.

April Construction Up

Dollar total of private construction contracts awarded in 37 Eastern States during March was 2.5 per cent. greater than the total for March, 1939, according to F. W. Dodge Corporation. This March record, added to previous gains, gave to first quarter's private construction volume moderate lead over first quarter of last year, though increase was not sufficient to offset declines that have taken place in public construction contracts. In March, contracts for public building and engineering projects ran 26 per cent. behind March of last year; the month's total of all construction contracts aggregated $272,178,000 last month, compared with $300,661,000 in March, 1939.

Commercial and manufacturing building contracts showed marked gains last month. Residential building, amounting to $121,708,000, was slightly under figure for March of last year, partly due to predominance of low-priced small houses in current program, and partly due to slowness of the U. S. H. A. public housing program. Public works and utilities contracts were only slightly under the March, 1939, figure.

Moves Chicago Office

Chemical Color Division, Reichhold Chemicals, Inc., has moved Chicago office to Suite 1007, Peoples Gas Building, 122 South Michigan ave.

Rufus M. Reed Dies

Rufus Maynard Reed, 62, president and founder, Western Dry Color, Chicago, died suddenly of coronary thrombosis. Mr. Reed was born in Polo, Illinois, and was graduated from University of Chicago in 1899.

Litter Appointed Agent

Krumbhaar Chemicals, Inc., South Kearny, N. J., has appointed D. H. Litter Co., Inc., as selling agents for Krumbhaar Modified Phenolic Resins.

Kienle Honored

John A. Kienle, Vice-President in charge of sales for Mathieson Alkali Works, was recently awarded honorary membership of the American Water Works Association at the annual convention in Kansas City.

Bogert Dinner May 24

Marston T. Bogert will be honored with testimonial dinner at N. Y. Chemists' Club May 24. Dr. Frank C. Whitmore will preside as toastmaster and Dr. Leo H. Baekeland will present a scroll to Dr. Bogert, a memento of his honorary membership.

AGRICULTURAL CHEMICALS

Sale of Mixed Fertilizers Shows Gain

Season Delayed By Wet Weather Finally Gets Under Way—Outlook is For Volume About Equal to '39—April Tag Sales Below Last Year—Nitrate of Soda Steady—Cotton Acreage Up

MARKET for agricultural chemicals came to life second week in April, and has continued in fair volume, moving from section to section. In some deep Southern sections, fertilizer season is over. In other sections, season is just reaching its height insofar as volume is concerned.

Best estimates place current season tonnage equal to, or slightly under very big '39 period. Lighter shipments to tobacco belt is one good reason. Some planters' requirements may go as low as 20 per cent. below preceding season. Part of this can be traced to British withdrawal from U. S. tobacco market. To take up this slack, come reports that cotton farmers are increasing acreage.

Midwest was still waiting for Spring during most of month. Deficiency in rainfall in some sections also presented a problem. In the Far West, it was floods which hampered activities. Both sections hold high hopes agriculturally, however, with possible increases in fertilizer shipments to these points.

Important Price Changes

	Apr. 29	Apr. 1
ADVANCED		
Fish scrap		
sardine, meal	$53.00	$52.00
Tankage		
unground	3.00	2.75
high grade feeding	3.35	2.85
import. S. Amer.	3.25	3.10
Nitrogeneous material, imp.	2.50	2.45
DECLINED		
Blood, dried, dom., N. Y.	$2.85	$3.10
Fish scrap, menhaden	3.50	4.05

Sulfate Export Demand Strong

Export demand for sulfate of ammonia continues strong. While material is available in limited quantities, contracts eat up most of it. Even on contract, shipments have had a tendency to be tardy. Second hands have taken advantage of situation in some sections, offering small quantities at a premium.

Deliveries of nitrate of soda were steadier during month, but season for this item runs month or more later than regular fertilizer chemicals. Weather during next two months will provide key to nitrate business.

Minor mixing ingredients turned firm toward month's end after decided weakness previously. Steamed bone lost $2 a ton around mid-month, but recovered 50 cents of this during final week. Other items on the same see-saw were menhaden fish scrap and tankage.

April Tag Sales Show Decline

Fertilizer sales in April, as indicated by the sale of tax tags amounted to 1,183,000 tons in the 17 reporting states. This represented a 7 per cent. decline from last year but total sales were moderately larger than two years ago.

Chemists' Club Golf June 4

D. W. Thompson, Welfare Committee, announces that plans are well under way for the annual Chemists' Club golf tournament at Winged Foot Golf Club, Mamaroneck, N. Y., Tuesday, June 4. Those who have attended these annual meetings know what excellent facilities are provided and what a fine time everyone has. As is the custom there will be a large distribution of prizes and competition will be for both members and guests. The committee would appreciate your making advance reservations for both dinner and golf.

New Trade Marks of the Month

NITROPHOSKA
425,817

COCHAR
424,157

VIKOSPRA
402,902

MOZEL
426,215

Firestone

FRIGITONE
423,132

Tantung
425,034

CELLOSOPE
425,918

ANTICAL
424,202

IOLATE
425,634

Cal-Nitro
425,816

VELVATEX
424,896

425,556

ANCO
419,648

„Philocytin"
401,691

PAINT PROGRESS
426,267

SHAVE-AID
374,633

KOGENE
425,469

HANDISAN
425,313

TROPIK
423,885

HYDRO-NU-MATIC
374,632

CALNITRO
426,274

ALKYMER
417,041

Clari Clay
424,331

Velva
425,424

RINOFEDS
425,385

PANARIAN
418,868

GALA
424,430

THERMOCOLOR
420,479

SKID CHEK
374,637

SANTOPOID
425,420

SUPER FELT
419,227

EKC
425,329

SULFACO
426,011

PERMALON
425,423

WOW
426,035

Plio Seal
423,866

DIASOL
426,400

ASAFEDS
426,071

EXO
423,784

WUD-OYL
375,153

Trade Mark Descriptions†

425,817. Synthetic Nitrogen Products Corp., New York, N. Y.; Nov. 18, 1939; for fertilizers. Since October, 1926.

424,157. Cochar Products, Inc., Manila, P. I.; Oct. 3, 1939; for activated carbon. Since Sept. 16, 1939.

402,902. Continental Oil Co., Ponca City, Okla.; Feb. 10, 1938; for dust settling oil. Since Feb. 1, 1935.

426,215. Mo-Zel Chemical Products Co., St. Louis, Mo.; Dec. 4, 1939. The color scheme is an essential feature of the mark. For non-saponaceous cleaning compound. Since Sept. 15, 1939.

423,132. The Firestone Tire & Rubber Co., Akron, Ohio; August 30, 1939; for anti-freeze composition. Since Jan. 1, 1934.

425,034. Fansteel Metallurgical Corp., North Chicago, Ill.; Nov. 1, 1939; for metals and alloys. Since Oct. 17, 1939.

425,918. Hardin Chemical Co., Inc., New York, N. Y.; Nov. 24, 1939; for dry cleaning soap powder for use in petroleum solvents in the dry cleaning of fabrics. Since Sept. 8, 1939.

424,202. Milk Plant Specialties Corp., Rochester, N. Y.; Oct. 4, 1939; for cleaning preparations. Since Sept. 25, 1939.

425,634. Allied Products, Inc., New York, N. Y.; Nov. 15, 1939; for liquid antiseptics. Since Nov. 10, 1939.

425,816. Synthetic Nitrogen Products Corp., New York, N. Y.; Nov. 18, 1939; for fertilizer. Since Nov. 15, 1928.

424,896. Richard W. Taylor (R. W. Taylor & Co.), Oct. 25, 1939; for compound for imparting a water repellent and wear resisting finish for knitted and woven textiles. Since Oct. 14, 1939.

425,556. California Container Corp., Emeryville, Calif.; Nov. 13, 1939; for shipping containers made of fibre board. Since Sept. 15, 1939.

419,648. The Anderson Co., Gary, Ind.; May 22, 1939; for hand glass cleaner. Since Nov. 27, 1934.

401,691. Cenovis-Werke G. M. B. H., Munich, Germany; Jan. 8, 1938; for medicinal or pharmaceutical yeast preparations. Since Oct. 23, 1933.

426,267. The New Jersey Zinc Co., New York, N. Y.; Dec. 5, 1939; for trade paper published from time to time. Since Nov. 27, 1939.

374,633. Not subject to opposition. Beverly Laidlaw, Santa Monica, Calif.; Sept. 6, 1938; for beard softening preparation. Since August 25, 1938.

425,469. The B. F. Goodrich Co., New York, N. Y., and Akron, Ohio; for hose for carrying corrosive liquids. Since August 16, 1939.

425,313. Turco Products, Inc., Los Angeles, Calif.; Nov. 6, 1939; for cleaning compound. Since August 21, 1939.

423,885. Harris-Seybold-Potter Co., Cleveland, Ohio; Sept. 23, 1939; for photographic fixing bath chemicals. Since August 1, 1939.

374,632. Not subject to opposition. The Parkersburg Rig & Reel Co., Parkersburg, W. Va.; May 14, 1938; for oil well pumping units. Since May 5, 1938.

426,274. Synthetic Nitrogen Products Corp., New York, N. Y.; Dec. 5, 1939; for fertilizer. Since Nov. 15, 1928.

417,041. Union Oil Co. of Calif., Los Angeles, Calif.; March 13, 1939; for internal combustion engine fuels. Since Feb. 16, 1939.

424,331. American Colloid Co., Chicago, Ill.; Oct. 9, 1939; for clays, particularly bentonite. Since Aug. 24, 1939.

425,424. Penick & Ford, Ltd., Inc., New York, N. Y.; Nov. 8, 1939; for laundry starches. Since Oct. 26, 1939.

425,385. George Martin Broemmel (Broemmel's Pharmaceuticals), San Francisco, Calif., Nov. 8, 1939; for preparation in capsule form. Since Jan. 1, 1932.

418,868. Cole Chemical Co., Wilmington, Del., and St. Louis, Mo.; April 29, 1939; for pharmaceutical preparation for ovarian therapy. Since Feb. 20, 1939.

424,430. Hercules Powder Co., Wilmington, Del.; Oct. 11, 1939; for aluminum sulfate. Since March 1, 1933.

420,479. I. G. Farbenindustrie A. G., Frankfort-on-the-Main, Germany; June 14, 1939; for heat-sensitive paint pigments. Since Aug. 31, 1938.

374,637. Not subject to opposition. Skid-Chek Corp. of Amer., St. Albans, Vt.; Feb. 7, 1939; for a cleaning compound for removing oil, grease, and road film from rubber. Since Nov., 1938.

425,420. Monsanto Chemical Co., St. Louis, Mo.; Nov. 8, 1939; for chemical adjuvants for petroleum oils. Since Oct. 19, 1939.

419,227. Johns-Manville Corp., New York, N. Y., May 9, 1939; for mineral wool insulation. Since April 21, 1939.

425,329. Eastman Kodak Co., Rochester, N. Y.; Nov. 7, 1939; for organic chemicals. Since Oct. 1, 1929.

426,011. R.R. Street & Co., Inc., Chicago, Ill.; Nov. 27, 1939; for soapless wet cleaner. Since Nov. 14, 1939.

425,423. Pierce Plastics, Inc., Bay City, Michigan; Nov. 8, 1939; for extruded strands, filaments, fibers, etc. Since July 25, 1939.

426,035. Petroleum Solvents Corp., New York, N. Y.; Nov. 28, 1939; for solvent and cleaner. Since Nov. 17, 1939.

423,866. Van Cleef Bros., Chicago, Ill.; Sept. 22, 1939; for tape comprising a rubber hydrohalide backing strip and an adhesive coating. Since Dec. 28, 1938.

426,400. Diamond Alkali Co., Pittsburgh, Pa.; Dec. 9, 1939; for dry cleaner. Since Oct. 21, 1939.

426,071. Sharp & Dohme, Inc., Philadelphia, Pa., Nov. 29, 1939; for preparation containing the drug asafetida. Since Nov. 21, 1930.

423,784. Bitucote Products Co., St. Louis, Mo.; Sept. 21, 1939; for emulsified petroleum coal treating material. Since June 1, 1938.

375,153. Not subject to opposition. W. H. Reed, Memphis, Tenn.; Nov. 30, 1938; for wood creosote. Since Nov. 8, 1938.

425,757. Schering Corp., Bloomfield, N. J.; Nov. 17, 1939; for chemical compound to be used in treatment of bacterial infection. Since Nov. 3, 1939.

423,058. Baltimore Biological Laboratory, Baltimore, Md.; August 28, 1939; for biological materials. Since Feb. 28, 1935.

425,772. Abbott Laboratories, North Chicago, Ill.; Nov. 18, 1939; for rectal anesthetic. Since Oct. 14, 1939.

425,879. Chemische Fabrik Tempelhof Preuss & Temmler, Berlin-Tempelholf, Germany; Nov. 22, 1939; for insecticides. Since 1922.

424,620. The Dow Chemical Co., San Francisco, Calif.; Oct. 17, 1939; for a number of chemical compounds. Since Jan. 1, 1917.

† Trademarks reproduced and described include those appearing in the *U. S. Patent Gazette*, Dec. 19, 1939, to Feb. 27, 1940, inclusive.

New Trade Marks of the Month

SULFACET
425,757

B-D-L
DESOXYCHOLATE-CITRATE AGAR
Powdered
423,058

ZYLCAINE
425,772

Atota
425,879

GREAT WESTERN DIVISION
BEAR BRAND
THE DOW CHEMICAL COMPANY
424,620

HERCULES
High Compression
GASOLINE
411,681

RAPID-GRO
375,344

CALIGESIC
426,073

CLIFFCHAR
422,925

TC
399,638

Thi-amino
426,216

THERMELT
427,518

COREX
426,484

AURINOL
429,269

THAWZONE
426,159

K-T-I
Knox The Itch
426,014

HYAMINE
421,052

ALUMESH
419,132

Triskalite
426,350

SAL BRICK
418,161

RIBOTHIRON
423,117

PRO MAT
423,710

GELSEALS
424,094

RIONA
424,741

BKC
WORLD WIDE DISTRIBUTION
411,180

TANNICJELL
375,360

RCI
WORLD-WIDE DISTRIBUTION
422,975

410,637

410,638

410,639

ALULOTION
426,042

HEXABIONE
427,636

ARM & HAMMER
410,640

Chelsea
419,880

DAROLENE
425,830

"Gentlemen Prefer Bronze"
426,033

FLAVOGEL
426,049

TOPLICATOR
426,347

SOLTENE
426,485

TAROVIL
426,546

META
426,624

411,681. Dryer, Clark & Dryer Oil Co., Oklahoma City, Okla.; Oct. 17, 1938; for high compression gasoline. Since Jan. 1, '27.

375,344. Not subject to opposition; Thomas P. Reilly, Binghamton, N. Y.; Dec. 15, 1938; for plant fertilizer. Since Nov. 1, 1938.

426,073. Sharp & Dohme, Inc., Philadelphia, Pa.; Nov. 29, 1939; for antiseptic and skin treating preparations. Since Nov. 21, 1939.

422,925. Cliffs Dow Chemical Co., Marquette, Mich.; August 24, 1939; for charcoal and activated carbon. Since Oct., 1934.

399,638. Tennessee Corp., New York, N. Y.; Nov. 9, 1937; for various chemical compounds. Since Jan. 1933.

426,216. Old Peacock Sultan Co., St. Louis, Mo.; Dec. 4, 1939; for liquid vitamin preparation. Since August 24, 1939.

427,518. The Resinous Products & Chemical Co., Philadelphia, Pa.; Jan. 16, 1940; for synthetic resinous materials. Since Dec. 14, 1939.

426,484. Crosby Naval Stores, Inc., Picayune, Miss.; Dec. 12, 1939; for resinous core binder. Since Jan. 18, 1939.

429,269. Onyx Oil and Chemical Co., Jersey City, N. J.; Dec. 5, 1939; for detergent. Since Nov. 13, 1939.

426,159. David Crampton (Highside Chemical Co.), Newark, N. J.; Dec. 2, 1939; for liquid dehydrant for refrigerants. Since May 2, 1938.

426,014. William J. Scherer (Scherer Drug Co.), Rochester, N. Y.; Nov. 27, 1939; for soothing cooling lotion. Since May 17, 1924.

421,052. Rohm & Haas Co., Philadelphia, Pa.; June 28, 1939; for phenolic tertiary amines. Since Sept. 14, 1934.

419,132. Whiting & Davis Co., Plainville, Mass.; May 5, 1939; for mesh bags made from a base metal. Since April 28, 1939.

426,350. Joseph J. Triska, New York, N. Y.; Dec. 7, 1939; for chemicals for electroplating. Since March 31, 1939.

418,161. Frank D. McBride (American Solder & Flux Co.), Philadelphia, Pa.; April 12, 1939; for soldering fluxx. Since Jan., 1923.

423,117. Sharp & Dohme, Inc., Philadelphia, Pa.; August 29, 1939; for preparations used in the treatment of metabolic deficiencies.

423,710. The Promat Co., Chicago, Ill.; Sept. 18, 1939; for metal coating compositions. Since August 2, 1939.

424,094. Eli Lilly and Co., Indianapolis, Ind.; Sept. 30, 1939; for elastic capsule covered with gelatin coating containing combinations of vitamins. Since Sept. 6, 1939.

424,741. Sharp & Dohme, Inc., Philadelphia, Pa.; Oct. 20, 1939; for preparations having vasco-constricting, sedative, analgesic, and anti-pyretic properties. Since Oct. 11, 1939.

411,180. Reichhold Chemicals, Inc., Detroit, Mich.; Oct. 1, 1938; for resins. Since Sept. 16, 1937.

375,360. Not subject to opposition. Tarr Pharmacal Co., Inc., assignor to Tarr Drug, Inc., both of Cleveland, Ohio; Sept. 30, 1939; for tannic acid jelly. Since Feb. 1, 1924.

422,975. Reichhold Chemicals, Inc., Detroit, Mich., August 22, 1939; for resins. Since June 20, 1939.

410,637-38-39. Church & Dwight Co., Inc., New York, N. Y., Sept. 16, 1938; for sal soda and washing soda. Since 1869.

426,042. John Wyeth & Brother, Inc., Philadelphia, Pa.; Nov. 28, 1939; for colloidal suspension of aluminum hydroxide in combination with other medicinal substances for treating infectious diseases of the skin. Since Nov. 14, 1939.

427,636. Merck & Co., Rahway, N. J.; Jan. 19, 1940; for therapeutic preparations. Since Jan. 11, 1940.

410,640. Church & Dwight Co., Inc., New York, N. Y.; Sept. 16, 1938; for sal soda and washing soda. Since 1874.

419,880. Shulton, Inc., New York, N. Y.; May 26, 1939; for soaps and saponaceous compounds. Since Feb. 15, 1934.

425,830. The Darco Corp., Canton, Ohio; Nov. 20, 1939; for boiler compound, radiator compound and water softener. Since March 8, 1939.

426,033. Parfums Charbert, Inc., New York, N. Y.; Nov. 28, 1939; for sun-tan oil. Since Nov. 17, 1939.

426,049. Ayerst, McKenna & Harrison (United States), Limited, Rouses Point, N. Y.; Nov. 29, 1939; for antiseptic dressing. Since Nov., 1939.

426,347. Schering Corp., Bloomfield, N. J.; Dec. 7, 1939. For container for medicinal hormone preparation. Since Nov. 24, 1939.

426,485. Crosby Naval Stores, Inc., Picayune, Miss.; Dec. 12, 1939; for terpene hydrocarbon solvent. Since Mar. 17, 1939.

426,546. Winthrop Chemical Co., Inc., New York, N. Y.; Dec. 13, 1939; for preparation for the treatment of anemias. Since Oct. 31, 1939.

426,624. Lonza Elektrizitatswerke & Chemische Fabriken A. G., Gampel, Switzerland; Dec. 15, 1939; for preparations for destroying snails and mollusks. Since July, '37.

Descriptions of Marks illustrated in April Issue, page 536, last column.

423,652. E. R. Ashbrook (Mission Chemical Co.), Kansas City, Mo.; Sept. 16, 1939; for chemicals used for the destruction of dandelions. Since Jan. 1, 1939.

425,833. General Mills, Inc., Minneapolis, Minn.; Nov. 20, 1939; for wheat germ oil. Since Nov. 17, 1939.

414,506. Pine Products Distributing Co., Patrick, S. C.; Jan. 4, 1939; for medicinal pine tar oil preparation. Since Aug. 15, 1938.

424,343. Vincent Christina Inc., New York, N. Y.; Oct. 9, 1939; for preparation—namely a pentavalent arsenical for use in syphilis therapy. Since Feb., 1939.

425,689. Doak Chemical Co., Inc., Cleveland, Ohio; Nov. 16, 1939; for dermatotherapeutic medication. Since April 1, 1939.

414,504. Pine Products Distributing Co., Patrick, S. C.; Jan. 4, 1939; for medicinal pine tar oil preparation. Since Aug. 15, 1938.

424,925. Bert F. Maxwell (Maxfal Chemical Co.), Brooklyn, N. Y.; October 26, 1939; for chemical preparation for removing carbon and other impurities from oil heating systems. Since Jan. 1, 1939.

425,738. Growers Fertilizer Co., Fort Pierce, Fla.; Nov. 17, 1939; for fertilizers. Since Sept. 29, 1938.

422,982. Botany Worsted Mills, Passaic, N. J.; August 25, 1939; for lanolin and cleansing cream. Since August 8, 1939.

413,920. Turco Products, Inc., Los Angeles, Calif.; Dec. 16, 1938; for synthetic cleaning agent. Since August 1, 1938.

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1939 Average $1.24 - Jan. 1940 $1.17 - Apr. 1940 $1.18

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	.10	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kgs lb.	.28	.50	.28	.50	.28	.50
Acetanilid, tech, 150 lb bbls lb.	...	.22	...	.22	.22	.29
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11½	.10½	.11½	.10½	.11
Acetin, tech, drs lb.	...	.33	...	.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.06	.05¾	.06	.04¼	.06
drs, c-l, f.o.b. wks, frt all'd lb.	...	.07½	.07¼	.07½	.05¾	.07¼
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb.	.08¾	.09	.08¾	.09	.08¾	.09
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.23	...	2.23	...	2.23
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	...	7.62
glacial, USP bbls, c-l, wks 100 lbs.	...	10.25	...	10.25	...	10.25
Acetylsalicylic, USP, 225 lb bbls lb.	...	.40	...	.40	.40	.50
Adipic, kgs, bbls lb.	...	.72	...	.72	...	.72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls lb.	...	.75	...	.75	...	.75
Ascorbic, bot oz.	2.25	2.50	2.25	3.00	2.75	3.25
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	96.00	...	96.00	...	96.00
Broenner's, bbls lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Camphoric, drs lb.	5.50	5.70	5.50	5.70	5.50	5.70
Caproic, normal, drs lb.	.35	.40	.35	.40	...	.35
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls lb. *b*	.20	.21½	.20	.21½	.20	.22½
anhyd, gran bbls lb *b*	...	.23	...	.23	.23	.25
Cleve's, 250 lb bbls lb.	...	.57	...	.57	...	.57
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.68	.70	.68	.70	.49	.70
99%, straw, LB, drs, wks, frt equal gal.	.68	.75	.68	.75	.55	.75
resin grade, drs, wks, frt equal lb.	.08¾	.09¾	.08¾	.09¾	.08¼	.09¾
Crotonic, bbls, delv lb.	.21	.50	.21	.50	.21	.50
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	.24	.28	.24	.75	...	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls lb.	.90	.93	.75	.93	.70	.73
USP, bbls lb.	.92	.95	.92	.95	.77	.81
Gamma, 225 lb bbls, wks lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks lb.	...	.45	...	.45	.50	.55
Hydriodic, USP, 47% lb.	...	2.30	...	2.30	...	2.30
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.42	.44	.42	.44	.42	.44
Hydrochloric, see muriatic						
Hydrocyanic, cyl, wks lb.	.80	1.00	.80	1.00	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.06	.06½	.06	.06½	.06	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¾	.02½	.03¾	.02½	.02¾
22%, light ref'd, bbls lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls lb.	.05½	.06¾	.05½	.06¾	.05½	.05¾
44%, dark, 500 lb bbls lb.	.06½	.07¾	.06½	.07¾	.06½	.06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.11½
USP X, 85%, cbys lb.	.43	.45	.42	.45	.42	.45
Lauric, drs lb.	.13½	.14	.13½	.14½	.11¾	.12¼
Laurent's, 250 lb bbls lb.	...	.45	.45	.46	.45	.46
Maleic, powd, kgs lb.	...	.30	.30	.40	.30	.40
Malic, powd, kgs lb.	...	.47	...	.47	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.05	.06	.05	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.16	.18
Monosulfonic, bbls lb.	...	1.50	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.; *y* Price given is per gal.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	...	1.50
tks, wks 100 lb.	...	1.05	1.00	1.05	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	...	1.75
tks, wks 100 lb.	...	1.15	1.10	1.15	...	1.10
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	...	2.25
tks, wks 100 lb.	...	1.65	1.60	1.65	...	1.60
CP, cbys lb.	.06½	.08	.06½	.08	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	nom.	nom.	.14	.10	.14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	11½	.12½
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	...	.12	.12	.14	.12	.14
50%, acid, c-l, drs, wks lb.	...	.12	.06	.12	.06	.08
75%, acid, c-l, drs, wks lb.	...	.07½	...	.07½	...	.07½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	...	.35	.35	.40	.35	.40
Propionic, 98% wks, drs lb.	...	.25	...	.25	...	.22
80% lb.	...	.20	...	.20	.16	.17½
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.20	1.05	1.20	1.45	1.63
cryst, USP lb.	1.70	2.25	1.55	2.25	1.55	2.10
Ricinoleic, bbls lb.	.27	.33	.27	.33	...	.35
tech, bbls lb.	...	.13	...	.13	...	.13
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.35	.40	.35	.40	.35	.40
Sebacic, tech, drs, wks lb.	no prices		no prices		...	...
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	.17	.18	.17	.18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks 100 lb.	...	1:50	...	1.50	...	1.50
CP, cbys, wks lb.	.06½	.08	.06½	.08	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	.54	.56	.44	.56	.40	.47
Tartaric, USP, gran, powd, 300 lb bbls lb.	.37½	.37¾	.35¼	.37¾	.27½	.31¼
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55	.67
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	no prices		no prices		1.70	1.80
Vanadic, drs, wks lb.	no prices		no prices		1.10	1.20
Albumen, light flake, 225 lb. bbls lb.	.55	.62	.55	.62	.52	.68
dark, bbls lb.	.13	.18	.13	.18	.13	.18
egg, edible lb.	.53	.59	.53	.62	.58	.78
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.101	...	.101	...	.101
c-l, drs, delv lb.	...	.111	...	.111	...	.111
lcl, drs, delv lb.	...	.121	...	.121	...	.121
Amyl, normal l-c-l drs	...	.08½	...	.08½	...	.08½
Wyandotte, Mich. lb.	...	.25	...	...	...	...
secondary, tks, delv lb.						
drs, c-l., delv E of Rockies lb.	...	.09½	...	09½	...	.09½
Benzyl, cans lb.	...	.68	.68	1.00	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.09	...	.09	.07	.09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.10	...	.10	.08	.10
Butyl, secondary, tks, delv lb. *d*	...	.06½	...	.06½	.05½	.06½
c-l, drs, delv lb. *d*	...	.07½	...	.07½	.06½	.07½
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
Denatured, CD, 14, c-l drs, wks gal. *e*	.31½	.36½	.31½	.36½	.27½	.36½
tks, East, wks gal.	...	.25½	...	.25½	.21½	.25½
Western schedule, c-l, drs, wks gal. *e*	...	.34½	...	.34½	.34½	.37
c-l, drs, wks gal. *e*	...	.21½	...	.21½	.19½	.22
Denatured, SD, No. 1, tks,	...	.22½	...	.22½	.25½	28½

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Alcohols (continued):					
Diacetone, pure, c-l, drs, delv ....lb. *f*	...	.12	...	.12	.09	.12
tech, contract, drs, c-l, delv ....lb.	...	.11½	...	.11½	.08½	.11½
Ethyl, 190 proof, molasses, tks ....gal. *g*	...	4.48	...	4.48	4.46	4.48½
c-l, drs ....gal. *g*	...	4.54	...	4.54	4.49	4.54½
c-l, bbls ....gal. *g*	...	4.55	...	4.55	4.53	4.55½
Furfuryl, tech, 500 lb drs lb.	...	.35	.25	.35	.25	.35
Hexyl, secondary tks, delv lb.	...	.12	...	.12	...	.12
c-l, drs, delv ....lb.	...	.13	...	.13	...	.13
Normal, drs, wks ...lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ....lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs..lb.	...	.073	...	.073	.073	.09
c-l, drs ....lb.	...	.069	...	.069	.068	.08½
tks ....lb.	...	.059	...	.059	...	.07½
Isopropyl, refd, 91%, c-l, drs, f.o.b. wks, frt all'd ....lb.	...	.65	...	.65	...	.36
Ref'd 98%, drs, f.o.b. wks, frt all'd .....gal.	...	.65	...	.65	...	.41
Tech 91% drs, above terms ....gal.	...	.33½	...	.33½	...	.33½
tks, same terms...gal.	...	.28½	...	.28½	...	.28½
Tech 98%, drs, above terms ....gal.	...	.36	.36	.37½	...	.37½
tks, above terms...gal.	...	.31	.31	.32½	...	.32½
Spec. Solvent, tks, wks gal.	...	.23½	...	.23½	.19	..23½
Aldehyde ammonia, 100 gal drs ....lb.	.80	.82	.80	.82	.80	.82
Aldehyde Bisulfite, bbls, delv ....lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ....lb.	.11	.12	.11	.12	.11	.20
Alphanaphthol, crude, 300 lb bbls ....lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ....lb.	...	.32	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	3.40	3.75
delv NY, Phila ...100 lb.	...	3.75	...	3.75	3.40	3.75
Granular, c-l, bbls wks ....100 lb.	...	3.50	...	3.50	3.15	3.50
Powd, c-l, bbls, wks 100 lb.	...	3.90	...	3.90	3.55	3.90
Chrome, bbls ....100 lb.	6.50	6.75	6.50	6.75	6.50	6.75
Potash, lump, c-l, bbls, wks ....100 lbs.	...	4.00	...	4.00	3.65	4.00
Granular, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	3.40	3.75
Powd, c-l, bbls, wks 100 lb.	...	4.15	...	4.15	3.80	4.15
Soda, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Aluminum metal, c-l, NY 100 lb.	...	19.00	19.00	20.00	...	20.00
Acetate, 20%, bbls ...lb.	.08	.09	.07½	.09	.07½	.09
Basic powd, bbls, delv lb.	.35	.50	.35	.50	.40	.50
Chloride anhyd, 99% wks lb.	.08	.12	.08	.12	.06	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06¼
Solution, drs, wks ...lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ....lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb bbls, delv ....lb.	.12½	.13½	.12½	.13½	.11½	.13
heavy, bbls, wks ....lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs ....lb.	.17½	.20	.16¾	.20	.16¾	.18½
Palmitate, bbls ....lb.	.20½	.21½	.20½	.24½	.23	.24½
Resinate, pp., bbls ....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ...lb.	.19	.20	.19	.20	.16	.22½
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.15	...	1.15	...	1.15
c-l, bbls, wks ....100 lb.	...	1.35	...	1.35	...	1.35
Sulfate, iron-free, c-l, bags, wks ....100 lb.	...	1.60	1.60	1.80	...	1.45
c-l, bbls, wks ....100 lb.	...	1.80	1.65	1.80	...	1.65
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
50 lb cyl ....lb.	...	.22	...	.22	...	.22
26°, 800 lb drs, delv ..lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH..cont.	...	.04z	...	.04z	...	.04z
Ammonium Acetate, kgs..lb.	.27	.33	.27	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks ....100 lb.	...	5.56	...	5.56	5.15	5.71
Bifluoride, 300 lb bbls..lb.	.14½	.16½	.14½	.16½	.14½	.16½
Carbonate, tech, 500 lb bbls ....lb.	.08	.11	.08	.11	.08	.12
Chloride, White, 100 lb bbls, wks ....100 lb.	4.45	...	4.45	4.90	4.45	4.90
Gray, 250 lb. bbls, wks ....100 lb.	5.50	5.75	5.50	6.25	5.50	6.25
Lump, 500 lb cks spot lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls....lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ....lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ....lb.	...	.12	...	.12	.11	.15
Naphthenate, bbls ....lb	...	.17	...	.17	...	.17
Nitrate, tech, bbls ....lb.	...	.0455	...	.0455	.036	.0455
Oleate, drs ....lb.	...	.14	...	.14	.11	.14
Oxalate, neut, cryst, powd, bbls ....lb.	.19	.20	.19	.20	.19	.20
Perchlorate, kgs ....lb.	.17	.19	.17	.19	...	.16
Persulfate, 112 lb kgs..lb.	.21	.22	.21	.22	.21	.24
Phosphate, diabasic tech, powd, 325 lb bbls ...lb.	.07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls ....lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls...lb.	...	.24½	...	.24½	.22	.24½
Paste, bbls ....lb.	...	.06½	...	.06½	.06½	.08

g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Ammonium (continued):					
Sulfate, dom, f.o.b., bulk ton	...	28.00	...	28.00	27.00	28.00
Sulfocyanide, pure, kgs..lb.	...	.65	...	.65	.55	.65
Amyl Acetate (from pentane)						
tks, delv ....lb.	...	.095	...	.095	.095	.10
c-l, drs, delv ....lb.	...	.105	...	.105	.105	.11
lcl, drs, delv ....lb.	...	.115	...	.115	.115	.112
tech drs, delv ....lb.	...	.12½	...	.12½	.10½	.12½
Secondary, tks, delv..lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	...	.09½
tks, delv ....lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed, drs, wks ....lb.	.0565	.0665	.0565	.0665	.0565	.077
tks, wks ....lb.	...	.0465	...	.0465	.0465	.06
Mercaptan, drs, wks....lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs...lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs..lb.	...	.26	...	.26	...	.26
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks ....lb.	...	.14½	...	.14½	.14½	.17½
Annatto fine ....lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80% ....lb.	...	.55	...	.55	.55	.75
Anthraquinone, sublimed, 125 lb bbls ....lb.	...	.65	...	.65	...	.65
Antimony metal slabs, ton lots ....lb.	...	.14	...	.14	.11¼	.14
Butter of, see Chloride.						
Chloride, soln, cbys ...lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ....lb.	...	.18	...	.18	.12	.20
Oxide, 500 lb bbls ....lb.	...	.15¾	...	.15¾	.10	.15¾
Salt, 63% to 65%, tins lb.	.42	nom.	.42	nom.	.25¾	.42
Archil, conc, 600 lb bbls .lb.	no prices		no prices		.21	.27
Double, 600 lb bbls ....lb.	no prices		no prices		.18	.20
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ....lb.	.09	.09½	.09	.10	.08½	.09
Arsenic, Metal ....lb.	...	...	...	...	.40	.60
Red, 224 lb cs kgs ....lb.	.17½	.18	.17½	.18	.18	.19
White, 112 lb kgs ....lb.	.03	.03¾	.03	.03¾	.03	.03¾
B						
Barium Carbonate precip, 200 lb bgs, wks ....ton	52.50	62.50	52.50	62.50	52.50	62.50
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	45.00	47.00	45.00	47.00	41.00	47.00
Chlorate, 112 lb kgs, NY lb.	.20	.22	.20	.22	.16½	.25
Chloride, 600 lb bbls, delv, zone 1 ....ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	.10	.12	.11	.12
Hydrate, 500 lb bbls ...lb.	.06½	.07	.06½	.07	.04½	.05½
Nitrate, bbls ....lb.	.09½	.10½	.09½	.10½	.06¾	.10½
Barytes, floated, 350 lb bbls c-l, wks ....ton	...	25.15	...	25.15	...	23.65
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ....ton	...	16.00	...	16.00	...	16.00
200 mesh ....ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ....lb.	.55	.60	.55	.60	.60	.62
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.16	...	.16	...	.16
90% c-l, drs ....gal.	...	.21	...	.21	...	.21
Ind pure, tks, frt all'd gal.	...	.16	...	.16	...	.16
Benzidine Base, dry, 250 lb bbls ....lb.	...	.70	...	.70	.70	.72
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.40	.45
Benzyl Chloride, 95-97% rfd, drs ....lb.	.19	.21	.19	.21	.30	.40
Beta-Naphthol, 250 lb bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.51	.52	.51	.52	.51	.52
Bismuth metal ....lb.	...	1.25	...	1.25	1.05	1.25
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ....lb.	3.35	3.46	3.35	3.46	3.15	3.40
Oxychloride, boxes ....lb.	...	3.10	...	3.10	2.95	3.10
Subbenzoate, boxes ....lb.	...	3.36	3.25	3.36	3.25	3.30
Subcarbonate, kgs ....lb.	1.73	1.76	1.73	1.76	1.43	1.76
Trioxide, powd, boxes...lb.	...	3.56	3.56	3.57	...	3.57
Subnitrate, fibre, drs....lb.	1.48	1.51	1.48	1.51	1.23	1.51
Blanc Fixe, 400 lb bbls, wks ton *h*	35.00	42.50	50.00	80.00	40.00	80.00
Beaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	...	2.00	...	2.00	...	2.00
lcl, drs, wks ....lb.	2.25	3.35	2.25	3.35	2.25	3.60
Blood, dried, f.o.b., NY unit	...	2.85	2.85	3.35	2.50	4.25
Chicago, high grade...unit	...	2.85	2.85	3.50	2.30	4.25
Imported shipt ....unit	...	2.90	2.90	3.30	2.65	3.90
Blues, Bronze Chinese						
Prussian Soluble ....lb.	.36	.37	.33	.37	.33	.37
Milori, bbls ....lb.	.33	.34	.33	.34	.33	.37
Ultramarine,* dry, wks, bbls ....lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	...	.16	...	.16	...	.16
Special, group 1 ....lb.	...	.19	...	.19	...	.19
Pulp, No. 1 ....lb.	.22	.27	.22	.27	...	.27
Bone, 4½ + 50% raw, Chicago ....ton	32.00	33.00	32.00	33.00	27.00	35.00
Bone Ash, 100 lb kgs....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp ton	...	32.50	32.00	32.50	22.00	32.00
Domestic, bgs, Chicago ton	...	50.00	30.00	32.00	24.00	32.00
Borax, tech, gran, 80 ton lots, sacks, delv ....ton *i*	...	43.00	...	43.00	...	43.00
bbls, delv ....ton *i*	...	53.00	...	53.00	...	53.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

Prices Current

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Borax (continued)					
Tech, powd, 80 ton lots, sacks .... ton i	...	48.00	47.00	48.00	...	47.00
bbs, delv .... ton i	...	58.00	57.00	58.00	...	57.00
Bordeaux Mixture, drs...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.30	.35	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	...	.57	...	.57	.90½	.92½
Gold, blk ....lb.	.60	.65	.60	.65	.45	.65
Butanes, com 16-32° group 3 tks ....lb.	.02½	.03	.02¼	.03¾	.02¼	.03¾
Butyl, Acetate, norm drs, frt all'd ....lb.	...	.10	...	.10	.09	.10
tks, frt all'd ....lb.	...	.09	...	.09	.08	.09
Secondary, tks, frt all'd lb.	...	.06½	...	.06½	.05½	.06½
drs, frt all'd ....lb.	.07½	.08	.07½	.08	.068	.08
Aldehyde, 50 gal drs, wks ....lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Crotonate, norm, 55 and 110 gal drs, delv ...lb.	...	.35	...	.35	.35	.75
Lactate ....lb.	.23½	.24½	.23½	.24½	.22½	.24½
Oleate, drs, frt all'd ..lb.	...	.25	...	.25	...	.25
Propionate, drs ....lb.	.16½	.17	.16½	.17	.16½	.18½
tks, delv ....lb.	...	.15½	...	.15½	.15½	.17
Stearate, 50 gal drs ...lb.	...	.28½	...	.28½	.26½	.28½
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
C						
Cadmium Metal ....lb.	.80	.85	.80	.85	.50	.85
Sulfide, orange, boxes .lb.	...	.75	.75	.85	.75	.90
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	1.90	...	1.90	1.65	1.90
Arsenate, c-l, E of Rockies. dealers, drs ....lb.	.06	.06½	.06	.07¼	.06¾	.07¼
Carbide, drs ....lb.	...	.04¾	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv..ton	...	22.00	...	22.00	...	22.00
paper bags, c-l, delv..ton	23.00	36.00	23.00	36.00	23.00	36.00
Solid, 650 lb drs, c-l, delv ....ton	...	20.00	...	20.00	...	20.00
Ferrocyanide, 350 lb bbls wks ....lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls ....lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks ....lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags ...ton	...	29.00	28.00	29.00	...	28.00
Palmitate, bbls ....lb.	.22	.24	.22	.24	.22	.23
Phosphate, tribasic, tech, 450 lb bbls ....lb.	.0635	.0705	.0635	.07½	.06½	.07½
Resinate, precip, bbls...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls...lb.	.20½	.22½	.20½	.22½	.19	.21
Camphor, slabs ....lb.	.85	.86	.83	.84	.46	.77
Powder ....lb.	.85	.86	.83	.84	.45	.47
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, delv, price varying with zone†...lb.	.028	...	.02¾	.03¾	.02¾	.03¾
lcl, bgs, f.o.b.whse....lb.	...	.06¼	...	.06¼	...	.06¼
cartons, f.o.b. whse.....lb.	...	.06¼	...	.06¼	...	.06¼
cases, f.o.b. whse......lb.	...	.07	...	.07	...	.07
Decolorizing, drs, c-l...lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv.....lb.	...	...	.66½	.66½	.05	.05½
Casein, Standard, Dom, grd lb.	.09½	.10½	.10	.14	.07	.23
80-100 mesh, c-l bgs....lb.	.11	.11½	.11	.14½	.07½	.23½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ....ton	...	17.50	...	17.50	16.50	18.50
Imported, ship, bgs....ton	...	20.00	...	20.00	18.00	20.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs ....lb.	...	.33	.33	.34	.35	.36
Chalk, dropped, 175 lb bbls lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Precip, heavy, 560 lb cks lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Light, 250 lb cks ......lb.	.03¼	.04	.03¼	.04	.03¼	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ...ton	25.00	36.00	25.00	36.00	23.00	36.00
Willow, powd, 100 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks lb.	...	.01¾	...	.01¾	...	.01⅝
25%, bbls, wks ....lb.	...	.02½	...	.02½	...	.02
China Clay, c-l, blk mines ton	...	9.50	7.60	9.50	7.00	7.60
Imported, lump, blk...ton	26.00	nom.	...	26.00	22.00	26.00
Chlorine, cyls, lcl, wks, contract ....lb.	...	.07¼	.07½	.08½	.07½	.08½
cyls, c-l, contract ...lb j	...	.05¼	...	.05¼	.05¼	.05½
Liq. tk, wks, contract 100 lb.	...	1.75	...	1.75	1.75	2.00
Multi, c-l, cyls, wks, cont ....lb.	...	.019	...	.019	1.90	2.15
Chloroacetophenone, tins, wks ....lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	...	.20	.20	.21	.20	.21
USP, 25 lb tins ......lb.	.30	.31	.30	.31	.30	.31
Chloropicrin, comml cyls .lb.	...	.80	...	.80	...	.80
Chrome, Green, CP .....lb.	.21	.25	.21	.25	.21	.25
Yellow ....lb.	.13½	.14½	.13½	.14½	.13½	.15½
Chromium Acetate, 8% Chrome, bbls ....lb.	...	.05¾	...	.05¾	.05	.08
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Coal tar, bbls ....bbl.	7.50	8.00	7.50	8.00	7.50	8.00
Cobalt Acetate, bbls .....lb.	...	.71	...	.71	.65	.71
Carbonate tech, bbls ...lb.	1.38	1.60	1.38	1.60	1.25	1.63
Hydrate, bbls ....lb.	...	1.78	...	1.78	...	1.78
Linoleate, solid, bbls ...lb.	...	.33	...	.33	...	.33
paste, 6%, drs ......lb.	...	.31	...	.31	...	.31
Oxide, black, bgs .....lb.	...	1.84	...	1.84	1.67	1.84
Resinate, fused, bbls ...lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls ....lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.35	.38
Teneriffe silver, bgs....lb.	.38	.39	.38	.39	.36	.39
Copper, metal, electrol 100 lb.	11.20	11.35	11.15	11.62½	.10	12.50
Acetate, normal, bbls, wks ....lb.	.22	.24	.22	.24	.21	.24
Carbonate, 52-54% 400 lb. bbls ....lb.	...	.1610	.1610	.169	.14½	.169
Chloride, 250 lb bbls ...lb.	...	.16	.16	.18	.12½	.18
Cyanide, 100 lb drs ....lb.	...	.34	...	.34	...	.34
Oleate, precip, bbls ....lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	...	.18	.18	.18¾	.15	.18¾
red 100 lb bbls ......lb.	...	.19½	.19½	.20	.15¾	.20
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.60	4.45	4.60	4.10	4.75
Copperas crys and sugar bulk c-l, wks ....ton	...	14.00	...	14.00	14.00	16.00
Corn Sugar, tanners, bbls 100 lb.	...	3.21	2.99	3.21	2.89	3.19
Corn Syrup, 42°, bbls 100 lb.	...	3.32	3.02	3.32	2.92	3.17
43°, bbls ....100 lb.	...	3.37	3.07	3.37	2.97	3.22
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls ....lb.	.30¾	.31¼	.28¼	.31¼	.22¼	.25¾
Creosote, USP 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks ......gal.	.13½	.14	.13½	.14	.13½	.14
Grade 2 ....gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs ....lb.	.09¾	.10¼	.09¾	.10¼	.09½	.10½
Crotonaldehyde, 97%, 55 and 110 gal drs, wks .....lb.	.11	.12	.11	.12	.11	.22*
Cutch, Philippine, 100 lb bale lb.	...	.04½	.04	.04½	.04	.04½
Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit	...	1.27½	...	1.27½	...	1.27½
D						
Derris root 5% rotenone, bbls ....lb.	.24	.30	.24	.30	.24	.30
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	3.70	3.40	3.70	3.30	3.75
British Gum, bgs ...100 lb.	...	3.95	3.65	3.95	3.55	3.95
Potato, Yellow, 220 lb bgs lb.	...	.07¾	...	.07¾	.07	.08¾
White, 220 lb bgs, lcl lb.	.08½	.09	.08½	.09	.08	.09
Tapioca, 200 bgs, lcl ...lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs...100 lb.	...	3.55	3.35	3.65	3.25	3.70
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	...	.47
lcl drs, wks ....lb.	...	.50	...	.50	...	.50
tks, wks ....lb.	...	.45	...	.45	...	.45
Diamylene, drs, wks .....lb.	.095	.102	.095	.102	.095	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ...lb.	.085	.092	.085	.092	.085	.092
tks, wks ....lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks..lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.19	.21
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ....lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	.51	.53	.51	.53	.53	.55
c-l drs, wks ....lb.	...	.50	...	.50	...	...
tks, wks ....lb.	...	.48	...	.48	...	...
Dibutyl Ether, drs, wks, lcl lb.	.24½	.25	.24½	.25	.24½	.25
Dibutylphthalate, drs, wks, frt all'd ....lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs lb.	...	.50	...	.50	.45	.54
Dichlorethylene, drs ......lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks ....lb.	.15	.16	.15	.16	.15	.16
tks, wks ....lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	...	.0221	...	.0221	no prices	
tks, wks ....lb.	...	.025	...	.025	no prices	
Diethanolamine, tks, wks..lb.	...	.22½	...	.22½	.22½	.23
Diethylamine, 400 lb drs, lcl, f.o.b., wks ....lb.	...	.70	...	.70	.70	3.00
Diethylaniline, 850 lb drs lb.	.40	.52	.40	.52	.40	.52
Diethyl Carbinol, drs ...lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	...	.25	...	.25	.31¾	.35
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs, wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14½	.15½	.14½	.15½	.14½	.17
Mono ethyl ethers, drs..lb.	.14½	.15½	.14½	.16	.15	.16
tks, wks ....lb.	...	.13½	...	.13½	.13½	.14
Mono butyl ether, drs..lb.	.22½	.24½	.22½	.24½	.23	.24
tks, wks ....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls....lb.	...	.16	.16	.21	.15	.23
Oleate, bbls ....lb.	...	.17	.13	.17	.13	.20
Stearate, bbls ....lb.	...	.22	.22	.26	.20	.28
Dimethylamine, 400 lb drs. pure 25 & 40% sol 100% basis ....lb.	...	1.00	...	1.00	...	1.00
Dimethylaniline, 340 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl Ethyl Carbinol, drs lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt all'd ....lb.	...	.18½	...	.18½	...	.19
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50

k Higher price is for purified material; * These prices were on a delivered basis.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Dinitrobenzene, 400 lb bbls lb. *k*	...	.18	.18	.19	.16	.19
Dinitrochlorobenzene, 400 lb bbls ... lb.	...	.14	...	.14	.13½	.14
Dinitronaphthalene, 350 lb bbls ... lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	.22	.23	.22	.24
Dinitrotoluene, 300 lb bbls lb.	...	.15½	...	.15½	...	.15½
Diphenyl, bbls ... lb.	.15	.20	.15	.20	.15	.25
Diphenylamine ... lb.	...	.25	.25	.32	.32	.32
Diphenylguanidine, 100 lb drs ... lb.	.35	.37	.35	.37	.31	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	nom.	...	nom.	...	nom.
Extract ... lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
E						
Egg Yolk, dom., 200 lb cases lb.	.57	.62	.57	.62	.59	.69
Epsom Salt, tech, 300 lb bbls c-l, NY ... 100 lb.	...	2.10	1.90	2.10	1.90	2.10
USP, c-l, bbls ... 100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ... lb.	...	.26	...	.26	.22	.23
Isopropyl 50 gal drs ... lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ... lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ... lb.	...	.68	...	.68	...	.68
Synthetic, wks, drs ... lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd' ... lb.	...	.07	.07	.06½	.051	.061
drs, frt all'd ... lb.	...	.08½	.07½	.08½	.061	.08
99%, tks, frt all'd ... lb.	...	.08	.0685	.08	.0585	.0685
drs, frt all'd ... lb.	...	.08¾	.0785	.08¾	.0685	.0785
Acetoacetate, 110 gal drs lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs ... lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ... lb.	.45	.50	.45	.50	.45	.50
Chloride, 200 lb drs ... lb.	.18	.20	.18	.20	.22	.24
Chlorocarbonate, cbys ... lb.	...	.30	...	.30	...	.30
Crotonate, drs ... lb.	...	.35	...	.35	.35	.75
Formate, drs, frt all'd ... lb.	.23	.24	.23	.24	.27	.28
Lactate, drs, wks ... lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks ... lb.	...	.25	...	.25	.30	.34
Oxybutyrate, 50 gal drs, wks ... lb.	1.00	nom.	.30	1.00	.30	.30½
Silicate, drs, wks ... lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ... lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ... lb.	.75	.85	.75	.85	.75	.85
Anhydrous ... lb.	...	.75	...	.75	...	.75
Dichloride, 50 gal drs, wks lb.	.0595	.0694	.0595	.0694	.0545	.0994
Glycol, 50 gal drs, wks ... lb.	.14½	.18½	.14½	.18½	.14½	.21
tks, wks ... lb.	...	.13½	...	.13½	.13½	.16
Mono Butyl Ether, drs, wks ... lb.	.16½	.17½	.16½	.21	.16½	.22
tks, wks ... lb.	...	.15½	...	.15½	.15½	.19
Mono Ethyl Ether, drs, wks ... lb.	.14½	.15½	.14½	.15½	.14½	.17
tks, wks ... lb.	...	.13½	...	.13½	.13½	.15
Mono Ethyl Ether Acetate, drs, wks ... lb.	.11½	.12½	.11½	.13	.11½	.14
tks, wks ... lb.	...	.10½	...	.10½	.10½	.13
Mono Methyl Ether, drs wks ... lb.	.15½	.16½	.15½	.17	.16	.22
tks, wks ... lb.	...	.14½	...	.14½	.14½	.17
Oxide, cyl ... lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ... lb.	45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ... ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks ... ton	14.00	17.50	14.00	17.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls ... lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ... lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground wks ... unit *l*	...	3.60	3.60	4.25	3.00	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ... unit *m*	...	3.50	3.00	3.50	2.35	3.00
Fluorspar, 98% bgs ... lb.	...	32.60	...	32.60	30.00	33.00
Formaldehyde, USP, 400 lb bbls, wks ... lb.	.055	.06	.05¾	.06¼	.05¾	.06¼
Fossil Flour ... lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	...	15.00	...	15.00	10.00	11.00
Imp powd, c-l, bgs ... ton	no prices		...	25.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs ... lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.17¼	.16	.17¼	.12½	.17¼
Fustic, crystals, 100 lb boxes ... lb.	.24	.25	.24	.28	.22	.28
Liquid 50°, 600 lb bbls lb.	.10½	.14	.10½	.14	.09½	.14
Solid, 50 lb boxes ... lb.	.19	.21	.19	.21	.17½	.21
G						
G Salt paste, 360 lb bbls ... lb.	...	.45	.45	.47	.45	.47
Gambier, com 200 lb bgs lb.	...	.07	...	.07	.06¾	.07¼
Singapore cubes, 150 lb bgs ... 100 lb.	...	.09	.09	.10	.08	.10
Gelatine, tech, 100 lb cs ... lb.	.42	.43	.42	.43	.42	.50
Glauber's Salt, tech, c-l, bgs, wks* ... 100 lb.	.95	1.18	.95	1.18	.95	1.18
Anhydrous, see Sodium Sulfate						

l + 10; m + 50; * Bbls. are 20c higher.

Current

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Glue, bone, com grades, c-l						
bgs ....lb.	.13½	.15	.13½	.15½	.13½	.15½
Better grades, c-l, bgs lb.	.15	.23	.15	.23	.11½	.15½
Glycerin, CP, 550 lb drs lb.	...	.12½	...	.12½	...	.12½
Dynamite, 100 lb drs ...lb.	...	nom.	...	nom.	...	.09
Saponification, drs .....lb.	...	.13	...	.13	.08½	.10
Soap Lye, drs ....lb.	.07¾	.08¼	.07¾	.08¼	.07½	.07⅞
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ...lb.	...	.27	...	.27	...	.27
Monostearate, bbls .....lb.	...	.30	...	.30	...	.30
Oleate, bbls ....lb.	...	.22	...	.22	...	.22
Phthalate ....lb.	...	.38	.37	.38	...	.37
Glyceryl Stearate, bbls ...lb.	...	.18	...	.18	.24	.27½
Glycol Bori-Borate, bbls..lbs.	...	.22	...	.22	.22	.23
Phthalate, drs ....lb.	...	.38	...	.38	.38	.40
Stearate, drs ....lb.	...	.26	...	.26	...	.26

GUMS

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Gum Aloes, Barbadoes ...lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ...lb.	.12¼	.12¾	.12¼	.14	.09	.24
White sorts, No. 1, bgs lb.	.33	.35	.33	.35	.23	.35
No. 2, bgs ....lb.	.32	.34	.32	.34	.21	.34
Powd, bbls ....lb.	.16¼	.18¾	.16¼	.17	.12½	.27
Asphaltum, Barbadoes						
(Manjak) 200 lb bgs,						
f.o.b. NY ....lb.	.04½	.05½	.02½	.10½	.02½	.10½
California, f.o.b. NY, drs ton	29.00	36.50	29.00	36.50	29.00	55.00
Egyptian, 200 lb cases,						
f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120						
lb cases ....lb.	.17	.18	.17	.24	.17	.34
Copal, Congo, 112 lb bgs,						
clean, opaque ....lb.	...	.29½	...	.29½	.18¼	.29½
Dark amber ....lb.	...	.11⅜	...	.11⅜	.07⅛	.11⅜
Light amber ....lb.	...	.17	...	.17	.11¼	.17
Copal, East India, 180 lb bgs						
Macassar pale bold ....lb.	...	.13⅞	.13⅞	.15⅝	.11⅜	.15¼
Chips ....lb.	...	.07½	.07½	.09	.05⅜	.08½
Dust ....lb.	...	.04¾	.04¾	.06¾	.03¼	.07⅛
Nubs ....lb.	...	.11⅛	.11⅛	.14⅜	.09½	.13¾
Singapore, Bold ....lb.	...	.14⅝	.14⅝	.17½	.14	.18¼
Chips ....lb.	...	.08⅜	.08⅜	.09⅛	.05⅝	.10¼
Dust ....lb.	...	.04¾	.04¾	.06¾	.03¼	.07⅛
Nubs ....lb.	...	.11	.11	.13½	.09⅝	.14⅜
baskets, Loba A ....lb.						
Copal Manila, 180-190 lb	...	.14¼	.14¼	.17⅜	.10½	.14⅞
Loba B ....lb.	...	.13¾	.13¾	.16¾	.09¾	.14½
Loba C ....lb.	...	.13½	.13½	.16⅛	.09	.14⅛
DBB ....lb.	...	.12⅛	.12⅛	.14½	.07⅞	.12½
MA sorts ....lb.	...	.06⅞	.06⅞	.08¾	.05⅛	.08½
Copal Pontianak, 224 lb	...	.09	.09	.13¾	.05⅞	.11
cases, bold genuine ..lb.						
Chips ....lb.	...	.15⅛	.15⅛	.18½	.15¼	.18½
Mixed ....lb.	...	.08⅜	.08⅜	.10½	.07⅛	.11½
Nubs ....lb.	...	.14⅛	.14⅛	.16⅝	.13⅜	.16⅝
Split ....lb.	...	.10¾	.10¾	.13½	.10½	.14⅜
Damar Batavia, 136 lb cases	...	.13½	.13½	.16⅛	.12	.16⅛
A ....lb.						
B ....lb.	...	.21⅝	.21⅝	.22¾	.20	.23¾
C ....lb.	...	.20⅛	.20⅛	.21⅛	.18½	.21⅛
D ....lb.	...	.14⅝	.15⅝	.15¼	.13½	.15⅝
A/D ....lb.	...	.13¼	.13¼	.13¾	.12¼	.14¼
A/E ....lb.	...	.13⅞	.13⅞	.14½	.12¾	.15¼
E ....lb.	...	.12⅞	.12⅞	.13⅜	.11⅜	.13¾
F ....lb.	...	.10	.10	.10⅜	.07⅜	.10
Singapore, No. 1 ......lb.	...	.08	.08	.08¾	.07¼	.08¾
No. 2 ....lb.	...	.16⅞	.16⅞	.19⅝	.13¼	.19½
No. 3 ....lb.	...	.12¾	.12¾	.15¾	.10½	.16⅜
Chips ....lb.	...	.07⅛	.07⅛	.09	.05¼	.09⅛
Dust ....lb.	...	.11	.11	.12½	.09¼	.12½
Seeds ....lb.	...	.07⅛	.07⅛	.09	.05¼	.09⅛
Elemi, cns, c-l ....lb.	...	.09⅞	.09⅞	.10½	.07⅜	.10½
Ester ....lb.	...	.10⅛	.10⅛	.11⅝	.08⅛	.12⅝
Gamboge, pipe, cases ....lb.	.06¼	.06¾	.06¼	.06¾	.06	.07
Powd, bbls ....lb.	.70	.75	.70	.75	.55	.80
Ghatti, sol, bgs ....lb.	.75	.80	.75	.80	.60	.85
Karaya, bbls, bxs, drs ...lb.	.11	.15	.11	.15	.11	.15
Dust ....lb.	.14	.33	.14	.33	.14	.33
Kauri, NY						
Brown XXX, cases ....lb.	...	.60	...	60	.60	.60½
BX ....lb.	...	.38	...	.38	...	.38
B1 ....lb.	...	.28	...	.28	...	.28
B2 ....lb.	...	.24	...	.24	...	.24
B3 ....lb.	...	.18½	...	.18½	...	.18½
Pale XXX ....lb.	...	.61	...	.61	...	.61
No. 1 ....lb.	...	.41	...	.41	...	.41
No. 2 ....lb.	...	.24	...	.24	...	.24
No. 3 ....lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins ....lb.	4.00	4.50	4.00	4.50	2.50	4.50
Mastic ....lb.	.85	.90	.85	.90	.55	.90
Sandarac, prime quality, 200						
lb bgs & 300 lb cks...lb.	.35	.36	.35	.37	.15	.37
Senegal, picked bags .....lb.	...	.30	...	.30	.25	.30
Sorts ....lb.	...	.13	...	.13	.09¼	.13
Thus, bbls ....280 lbs.	15.00	15.25	15.00	15.25	13.50	15.25
Tragacanth, No. 1, cases..lb.	2.65	2.70	2.65	2.70	2.25	2.50
No. 2 ....lb.	2.55	2.60	2.55	2.60	1.90	2.40
No. 3 ....lb.	2.45	2.50	2.45	2.50	1.60	2.25
Yacca, bgs ....lb.	.03½	.04	.03½	.04	.03½	.08

H

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Helium, cyl (200 cu. ft.) cyl.	...	25.00	...	25.00	...	25.00
Hematine crystals, 400 lb bbls lb.	.20	.30	.20	.30	.20	.34
Hemlock, 25%, 600 lb bbls.						
wks ....lb.	...	.03⅜	.03⅛	.03⅜	.03	.03⅜
tks ....lb.	...	.03	...	.03	.02⅝	.02¾
Hexalene, 50 gal drs, wks lb.	...	.80	...	.80	...	.30

	Current	Market	1940 Low	1940 High	1939 Low	1939 High
Hexane, normal 60-70° C. Group 3, tks ....gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs ....lb.	.32	.33	.32	.33	.32	.36
Hexyl Acetate, secondary, delv, drs ....lb.	.13	.13½	.13	.13½	.13	.13½
tks ....lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit	2.50	2.75	2.50	3.15	2.50	3.25
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	...	.20	...	.20	.19½	.20
Hydroxylamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	...	.14	...	.14	.13	.21
I						
Indigo, Bengal, bbls .....lb.	1.63	1.67	1.63	1.67	...	2.40
Synthetic, liquid ......lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars..lb.	...	2.00	...	2.00	1.75	2.00
Irish Moss, ord, bales ...lb.	.15	.16	.15	.16	.10	.10
Bleached, prime, bales ..lb.	.28	.30	.28	.30	.19	.20
Iron Acetate Liq. 17°, bbls delv ....lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls..100 lb.	2.75	3.00	2.75	3.00	2.32	3.11
Isobutyl Carbinol (128-132° C) drs, wks ....lb.	.33	.34	.33	.34	.33	.34
tks, wks ....lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt all'd ....lb.	...	.06	.05½	.06	.051	.06
drs, frt all'd ....lb.	.07	.07½	.06½	.07½	.061	.07
Ether, see Ether, isopropyl.						
Keiselguhr, dom bags, c-l, Pacific Coast ....ton	22.00	35.00	22.00	35.00	22.00	35.00
L						
Lead Acetate, f.o.b. NY, bbls, White, broken ....lb.	...	.11	...	.11	.10	.11
cryst, bbls ....lb.	...	.11	...	.11	.10	.11
gran, bbls ....lb.	...	.11¾	...	.11¾	.10¾	.11¾
powd, bbls ....lb.	...	.11¾	...	.11¾	.10¾	.11¾
Arsenate, East, drs ...lb.	...	.08½	.08½	.11	.10	.11½
Linoleate, solid, bbls...lb.	...	.19	...	.19	...	.19
Metal, c-l, NY .....100 lb.	5.10	5.15	5.05	5.25	4.75	5.55
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.10	.12
Oleate, bbls ....lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ....lb.	.07½	.0787	.07½	.08	.07¼	.08½
97% Pb_3O_4, delv ...lb.	.07¾	.081	.07¾	.08¼	.07½	.0835
98% Pb_3O_4, delv ...lb.	...	.08	.08	.08¾	.07¾	.0860
Resinate, precip, bbls..lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls ....lb.	...	.26	...	.26	.22	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd ....lb.	.10	.10¼	.10	.10¼	.11	.11½
White, 500 lb bbls, wks, lb.	...	.07	...	.07	...	.07
Basic sulfate, 500 lb bbls, wks ....lb.	.06¼	.06½	.06¼	.06½	...	.06¼
Lime, chemical quicklime, f.o.b., wks, bulk ...ton	7.00	13.00	7.00	13.00	7.00	8.00
Hydrated, f.o.b. wks...ton	8.50	16.00	8.50	16.00	8.50	12.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks.gal.	.07½	.08½	.07½	.11½	.08	.11½
drs ....gal.	...	.10½	.11	.16	.11	.16
Linseed Meal, bgs ......ton	...	33.00	33.00	37.00	34.00	42.00
Litharge, coml, delv, bbls lb.	.06¾	.07	.06½	.06¾	.06¼	.071
Lithopone, dom, ordinary, delv, bgs ....lb.	...	.036	...	.036	.03¾	.04⅛
bbls ....lb.	...	.03¾	...	.03¾	.04	.04⅜
High strength, bgs .....lb.	...	.05	...	.05	.05¼	.05⅝
bbls ....lb.	...	.05¼	...	.05¼	.05½	.05⅞
Titanated, bgs ....lb.	...	.05	...	.05	.05¼	.05⅝
bbls ....lb.	...	.05¼	...	.05¼	.05½	.05⅞
Logwood, 51°, 600 lb bbls lb.	.10½	.12½	.10½	.12½	.09½	.12½
Solid, 50 lb boxes ....lb.	.16½	.20½	.16½	.20½	.15	.20½
M						
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	58.00	62.00	58.00	66.00	58.00	66.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	...	.06¼	...	.06¼	.05¾	.06½
Chloride flake, 375 lb bbls, c-l, wks ....ton	32.00	42.00	32.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks ....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd .....lb.	...	.26	.25	.30	.25	.30
Light bbls above basis lb.	...	.26	.20	.26	.20	.25
USP Heavy, bbls, above basis ....lb.	.25	.30	.25	.30	.25	.30
Palmitate, bbls ....lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls ....lb.	.11	.11½	.11	.11½	.09½	.11½
Stearate, bbls ....lb.	.24	.27	.24	.27	.21	.24
Manganese, acetate, drs...lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.16
Chlorate, 600 lb cks....lb.	...	.08½	...	.08½	.07½	.12
Dioxide, tech (peroxide), paper bags, c-l ......ton	...	62.50	62.50	66.50	47.50	66.50
Hydrate, bbls ....lb.	...	.82	...	.82	...	.32
Linoleate, liq, drs .....lb.	.18	.19½	.18	.19½	.18	.19¼
solid, precip, bbls ....lb.	...	.19	...	.19	...	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs ....lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs ...lb.	.08	.08½	.08	.08½	.07	.08½
Mangrove, 55%, 400 lb bbls lbs.	...	...	...	...	...	.04
Bark, African ....ton	...	30.00	30.00	35.00	23.00	35.00

Current

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Mannitol, pure cryst, cs, wks lb.	.95	1.00	.95	1.00	.95	1.20
commercial grd, 250 lb bbls ....lb.	.42	.50	.42	.50	.42	.57
Marble Flour, blk ......ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride(Calomel) lb.	...	2.70	2.45	2.70	1.36	2.57
Mercury metal ..76 lb. flasks	171.00	228.00	171.00	228.00	95.00	170.00
Mesityl Oxide, f.o.b. dest., tks ....lb.	...	.15	...	.15	.10½	.15
drs, c-l ....lb.	...	.16	...	.16	.11½	.16
drs, lcl ....lb.	...	.16½	...	.16½	.12	.16½
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	...	1.30	1.30	1.40	1.30	1.55
Meta-phenylene diamine 300 lb bbls ....lb.	...	.65	...	.65	.80	.84
Meta-toluene-diamine 300 lb bbls ....lb.	...	.65	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l frt all'd ....gal.	...	.45	...	.45	.41	.46
tks, frt all'd ....gal.	...	.40	...	.40	.35	.40
Pure, drs, c-l, frt all'd' gal.	...	.35	.35	.38	...	.38
tks ....gal.	...	.30	.30	.33	...	.33
95%, tks ....gal.	...	.28	.28	.31	...	.31
97%, tks ....gal.	...	.29	.29	.32	...	.32
Methyl Acetate, tech tks, delv ....lb.	.06	.07	.06	.07	.06	.06½
55 gal drs, delv .....lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks,delv lb.	.09½	10½	.09½	.10½	...	.06¼
55 gal drs, delv .....lb.	.10½	.11½	.10½	.11½	.07¼	.07¾
Acetone, frt all'd, drs gal. *p*	.41	.44	.41	.44	.30	.44
tks, frt all'd, drs..gal. *p*	...	.35	.35	.39	.25	.35
Synthetic, frt all'd, east of Rocky M., drs ....gal. *p*	...	.44	.38	.44	.38	.41
tks, frt all'd ...gal.	...	.36	...	.36	...	.31½
West of Rocky M., frt all'd, drs..gal. *p*	...	.48	.42	.48	...	.42
tks, frt all'd...gal. *p*	...	.39½	.35	.39½	...	.35
Anthraquinone ....lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks .....lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd ....lb.	...	.70	...	.70	...	...
less than 100 lbs. f.o.b. wks ....lb.	...	.75	...	.75	...	...
Chloride, 90 lb. cyl ....lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks,frt all'd lb.	...	.06	.05½	.06	.05	.05½
50 gal drs, frt all'd' c-l lb	.07	.07½	.06½	.07½	.06	.07
Formate, drs, frt all'd..lb.	...	.89	...	.89	.35	.39
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd...lb.	...	.80	...	.80	...	.30
Mica, dry grd, bgs, wks..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ...lb.	...	2.50	...	2.50	...	2.50
Monoamylamine,c-l,drs,wks lb.	...	.52	...	.52	...	.52
lcl, drs, wks ....lb.	.53	.55	.53	.55	...	...
tks, wks ....lb.	...	.50	...	.50	...	...
Monobutylamine, drs, c-l, wks ....lb.	...	.50	...	.50	.50	.65
lcl, wks ....lb.	.51	.53	.51	.53	...	...
tks, wks ....lb.	...	.48	...	.48	...	...
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ....lb.	...	.65	...	.65	...	...
Monomethylamine, drs, frt all'd, E Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, lcl wks ....lb.	...	.75	...	.75	...	...
Myrobalans 25%, liq bbls lb.	no prices		no prices		.03¾	.04¼
50% Solid, 50 lb boxes lb.	no prices		no prices		.04¾	.05
J1 bgs ....ton	...	28.50	28.50	32.00	24.00	50.00
J2 bgs ....ton	...	24.00	23.00	25.00	19.00	41.00

N

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-whte, tks ....gal.	...	.27	...	.27	.26	.27
drs, c-l ....gal.	...	.32	...	.32	.31	.32
Naphthalene, dom, crude bgs. wks ....lb.	2.25	2.75	2.25	2.75	2.25	2.85
imported, cif, bgs ...lb.	...	3.00	...	3.00	1.50	1.85
Balls, flakes, pks ......lb.	.06¼	.07¾	.06¼	.07¾	.06½	.07½
Balls, ref'd, bbls, wks..lb.	...	.07	.06¾	.07	.05¾	.06¾
Flakes, ref'd, bbls, wks lb.	...	.07	.06¾	.07	.05¾	.06¾
Nickel Carbonate, bbls...lb.	.36	.36½	.36	.36½	.36	.37½
Chloride, bbls ....lb.	.18	.20	.18	.20	.18	.20
Metal ingot ....lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.37
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs ....lb.	...	.70	...	.70	.70	.76
Nitre Cake, blk ....ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled,1000 lb drs, wks ....lb.	.08	.09	.08	.10	.08	.10
tks ....lb.	...	.07	...	.07	.07	.07½
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.22	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
NitrogenousMat'l,bagsimp unit	...	2.40	2.40	2.60	2.25	2.85
dom, Eastern wks ...unit	...	2.50	2.50	2.90	2.30	3.00
dom. Western wks ...unit	...	1.95	1.95	2.00	1.90	2.25
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ...lb.	.29	.32	.29	.30	.22	.23

a Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Oak Bark Extract, 25%, bbls lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03½
tks . . . . . lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks . . . lb.	...	.15	...	.15	.15	.17
Orange-Mineral, 1100 lb cks NY . . . . . lb.	.10¾	.12	.10½	.12	.10¼	.10¾
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	...	.70	.70	.74	.70	.74
Orthochlorophenol, drs . . . lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.16	.16½	.16	.16½	.14½	.17½
Orthodichlorobenzene, 1000 lb drs . . . . . lb.	.06	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks . . . . . lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins . . . . . lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs . . . . . lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks . . . . . lb.	...	.09	...	.09	.08	.10
Orthotoluidine, 350 lb bbls, lcl . . . . . lb.	...	.19	...	.19	.16	.19
Osage Orange, cryst, bbls lb.	...	.21	...	.21	.17	.25
51° liquid . . . . . lb.	...	.10	...	.10	.07	.09
P						
Paraffin, rfd, 200 lb bgs						
122-127° M P . . . . . lb.	.066	.0675	.066	.0675	.03¾	.06¾
128-132° M P . . . . . lb.	.068	.0705	.068	.0705	.04	.0705
133-137° M P . . . . . lb.	.073	.0755	.073	.0755	.0465	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks . . lb.	.10	.11¼	.10	.11¼	.10	.16*
Aminoacetanilid, 100 lb kgs . . . . . lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs . . . . . lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs . . . . . lb.	...	.32	...	.32	.30	.45
Dichlorobenzene 200 lb drs, wks . . . . . lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls . . . . . lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wk . . . . . lb.	...	.47	...	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks . . . . . lb.	...	.15	.15	.16	.15	.16
Nitro-orthotoluidine, 300 lb bbls . . . . . lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls . . . . . lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	.30	.35
Phenylenediamine, 350 lb bbls . . . . . lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls . . . . . lb.	...	.70	.70	.75	.70	.75
tks, wks . . . . . lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks . . . . . lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks . . . . . lb.	...	.48	.48	.50	.48	.58
Paris Green, dealers, drs lb.	.23	.26	.23	.26	.23	.26
Pentane, normal, 28-38° C, group, 3 tks . . . . . gal.	...	.08½	...	.08½	...	.08½
drs, group 3 . . . . . gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 100 lb drs, frt all'd . . . . . lb.	.08	.08½	.08	.08¾	.08	.10½
Petrolatum, dark amber, bbls. . . . . . lb.	...	.03¼	.03¼	.05	.02⅝	.05
White, lily, bbls . . . . . lb.	...	.05½	.05½	.08½	.05¼	.08½
White, snow, bbls . . . . . lb.	...	.06½	.06½	.09½	.06¼	.09½
Petroleum Ether, 30-60°, group 3, tks . . . . . gal.	...	.13½	...	.13½	.13	.13½
drs, group 3 . . . . . gal.	.14½	.25½	.14½	.25½	.14	.25½
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group 3, tks, wks . . . . . gal.	06⅞	.07	.06⅞	.07	.06⅜	.07
East Coast, tks wks gal.	.09	.10½	.09	.10½	.09	.10
Hydrogenated, naphthas, frt all'd East, tks gal.	...	.16	...	.16	...	.16
No. 2, tks . . . . . gal.	...	.18	...	.18	...	.18
No. 3, tks . . . . . gal.	...	.16	...	.16	...	.16
No. 4, tks . . . . . gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks, East Coast . . . . . gal.	.09½	.10	.09½	.10	.09	.12½
Group 3, tks . . . . . gal.	...	.07⅞	...	.07⅞	.07⅜	.08
Naphtha, V.M.P., East tks, wks . . . . . gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks . . . gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Petroleum thinner, 43-47, East, tks, wks . . . . . gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, tks, wks . . gal.	...	.05⅞	.05⅞	.07	.05⅜	.06
Rubber Solvents, stand grd, East, tks, wks . . gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks . . gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Stoddard Solvents, East, tks, wks . . . . . gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, wks . . . . . gal.	.06⅜	.06½	.06⅜	.06½	.05⅞	.06½
Phenol, 250-100 lb drs . . lb.	.13	.14¾	.13	.14¾	.13	.15½
tks, wks . . . . . lb.	...	.12	...	.12	.12	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs . . . . . lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs . . . . . lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com . . . . . lb.	...	1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons . . . . . lb.	20.00	22.00	20.00	22.00	20.00	22.00

* These prices were on a delivered basis.

Current

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Phosphate Rock, f.o.b. mines						
70% basis ....ton	...	1.90	1.85	1.90	...	1.85
72% basis ....ton	...	2.15	2.15	2.35	...	2.35
Florida Pebble, 68% basis ton	...	2.40	2.40	2.85	...	2.85
75-74% basis ......ton	...	2.90	2.90	3.85	...	3.85
75% basis ....ton	...	5.50	...	5.50	...	5.50
Tennessee, 72% basis..ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl ....lb.	.15	.18	.15	.20	.16	.20
Red, 110 lb cases ......lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs..lb.	.38	.42	.38	.44	.38	.44
Trichloride, cyl ....lb.	.15	.16	.15	.18	.15	.18
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.24	.30
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	...	.14½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.53	.56	.53	.56	.46	.48
Steam dist wat wh bbls gal.	...	.59	...	.59	...	.59
tks ....gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbl, wks......ton	...	19.00	...	19.00	...	19.00
Burgundy, dom, bbls, wks lb.	.05½	.06½	.05½	.06½	.05½	.06½
Imported ....lb.	no prices		no prices		.15	.16
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	6.00	6.50	6.00	6.50	6.00	6.25
Platinum, ref'd ....oz.	35.00	38.00	35.00	40.00	32.00	40.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06½
flake ....lb.	.07	.07½	.07	.07½	.07	.07⅜
liquid, tks ....lb.	.03½	.03¾	.03½	.03¾	...	.02⅞
Manure Salts, imported 30% basis, blk .....unit	...	.58½	...	.58½	...	.58½
Potassium Abietate, bbls ..lb	...	.08	.08	.09	...	.09
Acetate, tech, bbls, delv lb.	...	.26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls ....lb.	no prices		...	.18	...	.18
Bichromate Crystals, 725 lb cks* ....lb.	.08⅞	.09¼	.08¾	.09¼	.08¾	.09¼
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks ....lb.	.06½	.06¾	.06½	.07	.06½	.07
liquid, tks ....lb.	...	.0275	.0275	.03	...	.02⅞
drs, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Chlorate crys, 112 lb kgs, wks ....lb.	.10½	.13	.10½	.13	.09¼	.13
gran, kgs ....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs ....lb.	.10	.12½	.10	.12½	.08½	.12½
Chloride, crys, bbls ...lb.	.04	nom.	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.24	.27	.24	.27	.19	.28
Cyanide, 110 lb cases...lb.	no prices		no prices		.50	.55
Iodide, 250 lb bbls .....lb.	...	1.35	...	1.35	1.13	1.35
Metabisulfite, 300 lb bbls lb.	.13	.15	.13	.15	.11	.18
Muriate, bgs, dom, blk unit	...	.53½	...	.53½	...	.53½
Oxalate, bbls ....lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks...lb.	.09½	.11	.09½	.11	.09	.10½
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19	.18½	.19½	.18½	.19½
Prussiate, red, bbls ....lb.	.38	.45	.38	.45	.30½	.45
Yellow, bbls ....lb.	.15	.16	.15	.16	.14	.16
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	36.25	38.00
Titanium Oxalate, 200 lb bbls ....lb.	.40	.45	.40	.45	.35	.45
Pot & Mag Sulfate, 48% basis bgs ....ton	...	24.75	...	24.75	24.75	25.75
Propane, group 3, tks ...lb.	.03¾	.04	.03	.04⅜	.03	.04⅜
Putty, com'l, tubs ...100 lb.	...	3.15	...	6.00	3.00	6.00
Linseed Oil, kgs ...100 lb.	...	5.00	...	4.50	...	4.50
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd ....gal.	7.15	7.50	7.15	7.50	5.75	7.50
3.6% pyrethrins, drs, frt all'd ....gal.	10.65	11.00	10.65	11.00	8.45	11.00
Flowers, coarse, Japan, bgs ....lb.	.33	.36	.33	.36	.26	.36
Fine powd, bbls .....lb.	.35	.37	.35	.37	.27	.37
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	1.63	1.71
Refined, drs ....lb.	...	.51	...	.51	.50	.51
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.75
Q						
Quebracho, 35% liq tks ..lb.	...	.03½	.03¼	.03½	.02⅞	.03⅜
450 lb bbls, c-l ......lb.	...	.04	...	.04	.04	.04⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.04½	...	.04½	.04	.04½
Clarified, 64% bales .lb.	...	.04¾	...	.04¾	.04¼	.04¾
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.08½	.09½	.08½	.09½	.07½	.08½
Solid, drs ....lb.	.11	.16½	.10	.16½	.10	.12
R						
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech, cans ...lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst .....lb.	.23¾	.24¼	.22¼	.23¼	.17¾	.21¾
Powd, bbls ....lb.	.22¾	.23¼	.21¾	.22¼	.16¾	.20¼
Rosin Oil, bbls, first run gal.	.45	.50	...	.50	.45	.47
Second run ....gal.	.51	.56	.52	.56	.47	.49
Third run, drs ....gal.	.52	.57	.56	.57	.51	.53
Rosins 600 lb bbls, 280 lb unit ex. yard NY:***						
B	...	5.25	5.25	6.25	4.60	5.45
D	...	5.40	5.40	6.25	4.95	5.70
E	5.75	5.80	5.75	6.55	5.20	6.40
F	5.90	6.00	5.90	6.85	5.50	6.75
G	6.00	6.02½	6.00	6.90	5.75	7.00
H	6.00	6.02½	6.07½	6.95	5.75	7.10
I	...	6.15	6.15	6.97½	5.77½	7.20

* Spot prices is ⅛c higher; *** April 29.

Prices

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Rosins (continued)						
K	...	6.30	6.85	7.00	5.80	7.20
M	6.60	6.65	6.60	7.02½	5.90	7.25
N	...	6.85	6.85	7.05	6.75	7.40
WG	...	7.10	7.05	7.12½	6.95	7.70
WW	...	7.50	7.50	7.60	7.45	8.50
Rosins, Gum, Savannah (280 lb unit):**						
B	...	3.85	3.85	4.80	3.25	4.00
D	...	4.00	4.00	4.80	3.55	4.30
E	4.35	4.40	4.35	5.15	3.80	5.00
F	4.50	4.60	4.50	5.45	4.00	5.35
G	4.60	4.62½	4.60	5.50	4.40	5.70
H	4.60	4.67½	4.60	5.55	4.40	5.70
I	...	4.75	4.75	5.57½	4.40	5.80
K	...	4.90	4.90	5.60	4.40	5.80
M	5.20	5.25	5.20	5.62½	4.40	5.85
N	...	5.45	5.45	5.65	5.10	6.00
WG	...	5.70	5.65	5.75	5.60	6.30
WW	...	6.10	6.10	6.20	6.05	7.10
X	...	6.10	6.10	6.20	5.60	7.10
Rosin, Wood, c-l, FF grade, NY	4.60	6.15	4.60	6.95	5.35	6.80
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	22.50	37.50
Imported, lump, bbls ... lb.	...	.14	...	.14	...	.14
Powdered, bbls ...... lb.	.08½	.10	.08½	.10	.08½	.10
S						
Sago Flour, 150 lb bgs .. lb.	.04	nom.	.04	.04½	.02½	.04½
Sal Soda, bbls wks ... 100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l. bulk wks ...... ton	...	17.00	...	17.00	19.00	25.00
Chrome, c-l, wks ...... ton	...	16.00	11.00	16.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls ...... lb.	...	.071	...	.071	.06½	.069
Cryst, bbls ...... lb.	...	.081	...	.081	.07½	.0865
Powd, bbls ...... lb.	..	.081		.081	.07½	.079
Satin, White, pulp, 550 lb bbls ...... lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ..... lb.	...	.46	.46	.48	.46	.48
Shellac, Bone dry, bbls .. lb. r	.25	.26	.25	.26	.18	.26
Garnet, bgs ...... lb.	...	.19½	.19	.23	.12½	.20
Superfine bgs ...... lb. t	.14½	.18	.14½	.20½	.10	.21
T. N., bgs ...... lb. t	.13½	.17	.13½	.19½	.09½	.20
Silver Nitrate, vials ..... oz.	...	.26⅞	...	.26⅞	.26⅞	.33½
Slate Flour, bgs, wks .... ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ...... 100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs ..... 100 lb.	1.05	1.08	1.05	1.08	...	1.08
blk ...... 100 lb.	...	.90	...	.90	...	.90
paper bgs ...... 100 lb.	...	1.05	...	1.05	...	1.05
bbls ...... 100 lbs.	..	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs ...... 100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs ..... 100 lb.	...	2.30	...	2.30	2.10	2.30
Liquid sellers, tks ... 100 lb.	...	1.97½	...	1.97½	...	1.97½
Sodium Abietate, drs .... lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks ...... lb.	.04	.05	.04	.05	.04	.05
anhyd, drs, delv ..... lb.	.08½	.10	.08¼	.10	...	.08¼
Alginate, drs ...... lb.	.71	.96	.71	.96	.70	.95
Antimoniate, bbls ..... lb.	.14½	.15	.14½	.15	.11½	.16
Arsenate, drs ...... lb.	.07	.08¾	.07	.08¾	.08	.08½
Arsenite, liq, drs .... gal.	...	.35	...	.35	.30	.35
Dry, gray, drs, wks .. lb.	.06½	.09¼	.06½	.09½	.07½	.09½
Benzoate, USP kgs ... lb.	.46	.52	.46	.52	.46	.48
Bicarb, powd, 400 lb bbl, wks ...... 100 lb.	...	1.70	1.70	1.85	...	1.85
Bichromate, 500 lb cks, wks* ...... lb.	.06⅞	.07¼	.06¾	.07¼	.06¾	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.031	.036
35-40% sol bbls, wks 100 lb.	1.30	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks ..... lb.	...	.06¼	.06¼	.08½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks ..... lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv ...... lb.	...	.09	...	.09	...	.09
Fluoride, white 90%, 300 lb bbls, wks ...... lb.	.07½	.08	.07	.08	.07	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks ...... lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	..	2.80	...	2.80	...	2.80
Tech, reg cryst, 375 lb bbls, wks ...... 100 lb.	2.45	...	2.45	2.80	2.45	2.80
Iodide, jars ...... lb.	...	2.30	...	2.30	...	2.30
Metal, drs, 280 lbs .... lb.	...	.19	...	.19	..	.19
Metanilate, 150 lb bbls .. lb	.41	nom.	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ...... 100 lb.	...	2.35	...	2.35	2.20	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	2.90	3.05
Monohydrated, bbls ... lb.	...	.023	...	.023	...	.023
Naphthenate, drs ...... lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	.50	.54
Nitrate, 92% crude, 200 lb bgs, c-l, NY ...... ton	...	28.30	...	28.30	...	28.30
100 bgs, same basis . ton	...	29.00	...	29.00	...	29.00
Bulk ...... ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls .... lb.	.06¾	.11½	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l ...... lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb .. lb.	.14¾	.15¼	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb .. lb.	...	.17	...	.17	...	.17

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case: t T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *Spot price is ⅛c higher.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Sodium (continued):						
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.30	...	2.30	2.05	2.30
bgs, wks ......100 lb.	...	2.10	...	2.10	1.85	2.10
Tri-sodium, tech, 325 lb. bbls, wks ......100 lb.	...	2.45	...	2.45	2.20	2.45
bgs, wks ......100 lb.	...	2.25	...	2.25	2.00	2.25
Picramate, 160 lb kgs ..lb.	...	.65	.65	.67	.65	.67
Prussiate, Yellow, 350 lb. bbls, wks ....lb.	.09½	.09¾	.09½	.09¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	...	.0530	...	.0530	...	.0530
Sesquisilicate, drs, c-l, wks ....100 lb.	...	2.90	...	2.90	2.80	2.90
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.40	1.80	1.40	1.80	1.65	1.70
40°, 55 gal drs, wks 100 lb	...	.80	...	.80	...	.80
tks, wks ......100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	no prices		no prices		.03½	.04¾
Stannate, 100 lb drs ...lb.	.31½	.34½	.31½	.34½	.30	.35
Stearate, bbls ....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks ....100 lb. ‡	1.45	1.65	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks ....lb.	.02¼	.03	.02¼	.03	.02¼	.02½
Solid, 650 lb drs, c-l, wks ....lb.	.03	.03¾	.03	.03¾	.03	.03½
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.0255	.023	.02½	.023	.02½
Sulfocyanide, drs ......lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls....lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		1.05	1.10
Sorbitol, com, solut, wks c-l, drs, wks ....lb.	.15½	.16	.15½	.16	...	.15½
Spruce, Extract, ord, tks ..lb.	...	.01⅛	...	.01⅛	...	.01⅛
Ordinary, bbls .....lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, tks ..lb.	...	.01⅜	...	.01⅜	...	.01⅜
Super spruce ext, bbls ..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext. powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	2.80	2.50	2.80	2.40	2.85
Powd, 140 lb bgs ...100 lb.	...	2.90	2.60	2.90	2.50	2.90
Potato, 200 lb bgs .....lb.	.05½	.06	.05	.06¼	.04	.06¾
Imp, bgs ....lb.	...	.06½	...	.06½	.05	.06½
Rice, 200 lb bbls ......lb.	...	.07¼	...	.07¼	.06¼	.07¼
Sweet Potato, 240 lb bbls, f.o.b. plant ......100 lb.	...	6.00	5.50	6.00	5.50	7.50
Wheat, thick, bgs .....lb.	...	.05½	...	.05½	.05	.05½
Strontium, carbonate, 600 lb bbls, wks ....lb.	...	.23	.22	.23	.16	.24
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¼
Sucrose, octa-acetate, den, grd, bbls, wks ......lb.	...	.45	...	.45	...	.45
tech, bbls, wks ....lb.	...	.40	...	.40	...	.40
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ...100 lb.	1.60	1.95	1.60	2.35	1.65	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs..100 lb.	...	2.00	2.00	2.80	2.20	2.80
bbls ....100 lb.	...	2.35	2.35	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	...	2.35	2.85	3.00	2.85	3.00
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ......100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	...	2.35	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.85	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks ....lb.	.03	.08	.03	.08	.03	.04
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks ....lb.	.04	.06	.04	.06	.04	.05
Refrigeration, cyl, wks lb.	.16	.17	.16	.17	.16	.17
Multiple units, wks ...lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	...	130.00	98.00	140.00	65.50	85.00
Extract, 42°, bbls .....lb.	.06	.06¼	.06	.06¼	.05¼	.06¼
Superphosphate, 16% bulk, wks ....ton	...	9.00	...	9.00	8.00	9.00
Run of pile ....ton	...	8.50	...	8.50	7.50	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.70	...	.70	...	.70
T						
Talc, Crude, 100 lb bgs, NY ton	14.00	15.00	14.00	15.00	13.00	15.00
Ref'd 100 lb bgs, NY ton	15.00	17.00	14.00	17.00	14.00	16.00
French, 220 lb bgs, NY ton	23.00	35.00	23.00	35.00	23.00	30.00
Ref'd, white bgs, NY ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	64.00	67.00	64.00	70.00	60.00	70.00
Ref'd', white bgs, NY ton	67.00	78.00	65.00	78.00	65.00	70.00
Tankage, Grd, NY ...unit ¤	...	2.85	2.85	3.25	2.75	3.25
Ungrd ....unit ¤	...	3.10	3.10	3.25	2.75	5.00
Fert grade, f.o.b. Chgo unit ¤	...	3.35	3.35	3.50	2.50	4.50
South American cif unit ¤	...	3.35	3.35	3.50	3.00	4.00
Tapioca Flour, high grade, bgs ....lb.	.02¾	.04½	.02¾	.04½	.01¾	.05½
Tar Acid Oil, 15%, drs ..gal.	.22	.24	.22	.24	.21	.24
25% drs ....gal.	.26	.28	.26	.28	.25	.28
Tar, pine, delv, drs......gal.	.26	.27	.26	.27	.25	.27
tks, delv, E. cities ....gal.	...	.21	...	.21	.20	.21
Tartar Emetic, tech, bbls lb.	.34¾	nom.	.34¾	.35	.27¾	.35
USP, bbls ....lb.	.40	nom.	...	.40	.33	.40
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09½	...	.09½
Tetralene 50 gal drs, wks lb.	...	.12	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbls lb.	...	.24	.20	.25	.20	.25

‡ Bags 15c lower; ¤ + 10.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Tin, crystals, 500 lb bbls, wks lb.	.37	.37½	.36	.37½	.35½	.39
Metal, NY ....lb.	...	.47½	.45½	.47½	.45½	.60
Oxide, 300 lb bbls, wks lb.	.51	.53	.51	.53	.50	.54
Tetrachloride, 100 lb drs, wks ....lb.	...	.23¼	.23	.24¾	.23	.32
Titanium Dioxide, 300 lb bbls lb.	.13	.16	.13	.16	.13¼	.16
Barium Pigment, bbls ..lb.	.05¼	.06½	.05¼	.06½	.05⅝	.06½
Calcium Pigment, bbls lb.	.05	.06¼	.05	.06¼	.05⅜	.06½
Titanium tetrachloride, drs. f.o.b. Niagara Falls ....lb.	.32	.45	.32	45	.32	.45
Titanium trichloride 23% sol. bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls ....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	..	.26	.26	.27	.26	.27
Toluol, 110 gal drs, wks gal.	...	.30	.27	.30	...	.27
8000 gal tks, frt all'd gal.	...	.25	.22	.25	...	.22
Toner Lithol, red, bbls ..lb.	.55	.60	.55	.60	.55	.80
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.80
Toluidine, bgs ....lb.	...	1.05	1.05	1.35	...	1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	.27	...	.27
Triamylamine, c-l, drs, wks lb.	...	.77	...	.77	.77	1.25
lcl, wks, drs ....lb.	.78	.80	.78	.80	...	...
tks, wks ....lb.	...	.75	...	.75	...	...
Tributylamine, lcl, drs, wks lb.	.68	.70	.68	.70	...	.70
c-l, drs, wks ....lb.	...	.67	...	.67	...	...
tks, wks ....lb.	...	.65	...	.65	...	...
Tributyl citrate, drs, frt all'd lb.	...	.35	...	.35	.35	.45
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	...	.42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	.09	.08	.09	.08	.09½
Tricresyl phosphate, tech, drs, lb.	.22	.36½	.22	.36½	.22	.37½
Triethanolamine, 50 gal drs wks ....lb.	...	.19	.19	.22	.21	.22
tks, wks ....lb.	...	.18	.18	.20	...	.20
Triethylamine, lcl, drs, f.o.b. wks ....lb.	...	1.05	...	1.05	...	
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ....lb.	...	.30	...	.30	...	.30
Stearate bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest ....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ...lb.	...	1.00	...	1.00	...	1.00
Triphenylguanidine, ...lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs ..lb.	...	.38	...	.38	...	.38
Tripoli, airfloated, bgs, wks ton	...	26.00	26.00	30.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.33¾**	.33¾	.40	.29	.35
Savannah, bbls ....gal.	...	.27¾*	.27¾	.34	.23½	.29
Jacksonville, bbls .....gal.	no prices		.26	.34¾	.23½	.26¾
Wood Steam dist, drs, c-l, NY ....gal.	...	.31	.31	.34½	.242	.34
Wood, dest dist, c-l, drs, delv E. cities ......gal.	.31	.34	.23	.31	.22	.25
U						
Urea, pure 112 lb cases ..lb.	...	.13	.13	.15½	.14½	.15½
Fert grade, bgs, c. i. f. S.A. points ....ton	95.00	101.00	95.00	110.00	95.00	110.00
Dom f.o.b., wks ......ton	...	85.00	85.00	101.00	95.00	101.00
Urea Ammonia, liq., nitrogen basis ....ton	...	121.58	...	121.58	...	...
V						
Valonia beard, 42%, tannin bgs ....ton	...	49.00	47.00	54.00	45.00	57.00
Cups, 32% tannin bgs ..ton	38.00	39.00	33.00	39.00	27.00	39.00
Extract, powd, 63% ...lb.	.0565	nom.	.0565	.06	.05	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ....lb.	...	2.60	...	2.60	2.20	2.60
Ex-guaiacol ....lb.	...	2.50	...	2.50	2.10	2.50
Ex-lignin ....lb.	...	2.50	...	2.50	2.10	2.50
Vermilion, English, kgs ..lb.	no prices		...	2.76	1.50	2.97
W						
Wattle Bark, bgs ....ton	34.00	35.75	34.00	38.75	34.50	40.00
Extract, 60°, tks, bbls ..lb.	...	.04¼	...	.04¼	.04	.05½
Wax, Bayberry, bgs .....lb.	.25	.26	.25	.30	.16⅞	.39
Bees, bleached, white 500 lb slabs, cases ......lb.	...	.38	...	.38	.33	.40½
Yellow, African, bgs ..lb.	.26	.26½	.26	.28	.18½	.30
Brazilian, bgs .....lb.	.26	.26½	.26	.29	.21	.33
Refined, 500 lb slabs, cases lb.	.31	.36	.31	.36	.25½	.36
Candelilla, bgs ....lb.	.18½	.19	.18	.19	.15¼	.19
Carnauba, No. 1, yellow, bgs ....lb.	.83	.85	.69	.85	.36¾	.78
No. 2, yellow, bgs ...lb.	.82	.84	.68	.84	.35¾	.45
No. 2, N. C., bgs ...lb.	.71	.73	.46	.73	.34	.41
No. 3, Chalky, bgs ...lb.	.64	.66	.43	.66	.27½	.46
No. 3, N. C., bgs ...lb.	.66	.68	.47	.68	.28¾	.49
Ceresin, dom, bgs .....lb.	.11½	.12	.11½	.15	.08½	.15
Japan, 224 lb cases ....lb.	.15½	.16	.15½	.16½	.09¾	.18
Montan, crude, bgs ....lb.	no prices		no prices		.11	.11¾
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.22	.23	.22	.25	.18	.25
Cakes, cases ....lb.	.23	.24	.23	.25	.19	.26
Whiting, chalk, com 200 lb bgs, c-l, wks ....ton	16.00	20.00	12.00	20.00	12.00	14.00
Gilders, bgs, c-l, wks ..ton	17.00	18.50	15.00	18.50	...	15.00
Wood Flour, c-l, bgs ....ton	24.00	25.00	20.00	30.00	20.00	30.00
Xylol, frt all'd, East 10° tks, wks ....gal.	...	.30	...	.30	.29	.30
Com'l tks, wks, frt all'd, gal	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1000 lb lots, wks ....lb.	...	.20	...	.20	...	...

* Apr. 29. ** Apr. 29.

Current

Zinc Acetate
Oil, Whale

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Zinc Acetate, tech, bbls, lcl, delv ... lb.	.15	.16	.15	.16	.15	.21
Arsenite, bgs, frt all'd .. lb.	...	.12	.12	.12½	.12	.13
Carbonate tech, bbls, NY lb.	.14	.16	.14	.16	.14	.15
Chloride fused, 600 lb drs, wks ... lb.	...	.04¼	.04¼	.046	.04¼	.046
Gran, 500 lb drs, wks lb.	...	.05	.05	.05¾	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25	...	2.25
Cyanide, 100 lb drs ... lb.	...	.33	...	.33	...	.33
Dust, 500 lb bbls, c-l, delv lb.	...	.07¾	.07½	.07¾	.06½	.08½
Metal, high grade slabs, c-l, NY ... 100 lb.	...	6.14	5.90	6.14	4.84	6.40
E. St. Louis ... 100 lb.	...	5.75	4.60	5.75	4.60	6.00
Oxide, Amer, bgs, wks lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
French 300 lb bbls, wks lb.	.06½	.07¾	.06½	.07¾	.06½	.07¾
Palmitate, bbls ... lb.	.24½	.27½	.23	.27½	.23	.25
Resinate, fused, pale bbls lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls ... lb.	...	.23	.21½	.24½	.20	.24½
Sulfate, crys, 400 lb. bbls wks ... lb.	...	.0275	.0275	.029	...	.029
Flake, bbls ... lb.	...	.0325	...	.0325	...	.0325
Sulfide, 500 lb bbls, delv lb.	...	.07¾	.07¾	.08	.07¾	.08⅞
bgs, delv ... lb.	...	.07½	.07½	.07¾	.07½	.08⅝
Sulfocarbolate, 100 lb kgs lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 73-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Babassu, tks, futures ... lb.	...	.06⅜	.06⅛	.06⅝	.05⅞	.07⅝
Castor, No. 3, 400 lb drs lb.	...	.12¾	...	.12¾	.08¼	.12¾
Blown, 400 lb drs ... lb.	...	.14¾	...	.14¾	.10¼	.14¾
China Wood, drs, spot NY lb.	.23½	.26½	.23½	.28	.15	.28
Tks, spot NY ... lb.	.22½	.26	.22½	.27	.14½	.27
Coconut, edible, drs NY .. lb.	...	.08⅜	.08⅜	.09⅜	.08⅛	.10⅛
Manila, tks, NY ... lb.	...	.03⅜	.03	.03⅜	.02⅞	.04⅝
Tks, Pacific Coast ... lb.	.02⅝	.02¾	.02⅝	.03½	.02⅝	.04⅜
Cod, Newfoundland, 50 gal bbls ... gal.	.65	nom.	.65	.72	.29	.72
Copra, bgs, NY ... lb.	.0185	.0190	.0165	.0190	.0160	.2625
Corn, crude, tks, mills ... lb.	.06⅜	.06½	.06⅛	.06½	.05⅛	.07⅛
Refd, 375 lb bbls, NY .. lb.	.08¾	.09	.08½	.09	.07½	.09¾
Degras, American, 50 gal bbls NY ... lb.	.08½	.09½	.08½	.10	.07	.10
English, bbls ... lb.	.08½	.09½	.08½	.10	.07	.10
Greases, Yellow ... lb.	.04⅝	.04¾	.04⅝	.05¼	.03⅞	.06¾
White, choice, bbls, NY lb.	.05⅛	.05¼	.05⅛	.05⅝	.04½	.07½
Lard, Oil, edible, prime .. lb.	...	.09½	.09¼	.10	.09	.11¼
Extra, bbls ... lb.	...	.08⅝	.08⅜	.09⅜	.08	.10⅜
Extra, No. 1, bbls ... lb.	...	.08½	.08¼	.08⅞	.07¾	.10⅛
Linseed, Raw less than 5 bbl lots ... lb.	...	.116	.110	.116	.092	.119
bbls, c-l, spot ... lb.	.108	.110	.102	.110	.084	.111
Tks ... lb.	.102	.104	.096	.104	.078	.104
Menhaden, tks, Baltimore gal.	.32	nom.	.32	.35	.21	.35
Refined, alkali, drs ... lb.	...	.079	.071	.079	.062	.082
Tks ... lb.	...	.067	...	.067	.056	.076
Kettle boiled, drs ... lb.	...	.091	...	.093	.074	.094
Light pressed, drs ... lb.	...	.073	...	.075	.056	.076
Tks ... lb.	...	.067	...	.069	.067	.069
Neatsfoot, CT, 20°, bbls, NY lb.	...	.17	.17	.19¼	.14¾	.19¾
Extra, bbls, NY ... lb.	...	.08½	.08¼	.09	.08	.10⅛
Pure, bbls, NY ... lb.	...	.12¾	.12¾	.14¼	.10¾	.16¾
Oiticica, bbls ... lb.	.18	.19	.19	.21	.09¼	.21
Oleo, No. 1, bbls, NY ... lb.	...	.07½	.07¼	.07¾	.07¼	.12
No. 2, bbls, NY ... lb.	...	.07¼	.07	.07½	.06¾	.11¾
Olive, denat, bbls, NY .. gal.	.95	.96	.94	.98	.82	1.40
Edible, bbls, NY ... gal.	1.85	1.95	1.85	2.00	1.75	2.25
Foots, bbls, NY ... lb.	.08¼	.08⅜	.08	.08½	.06¾	.10
Palm, Kernel, bulk ... lb.	no prices		no prices		.034	.036
Niger, cks ... lb.	...	.04½	.04⅜	.05½	.03⅝	.05½
Sumatra, tks ... lb.	...	.02½	.03	nom.	.0265	.02¾
Peanut, crude, bbls, NY lb.	.07¼	.07⅜	.06¾	.07⅜	.06	.08
Tks, f.o.b. mill ... lb.	.06⅝	.06¾	.06½	.07⅛	.05¼	.07¼
Refined, bbls, NY ... lb.	.09¼	.09½	.09⅜	.09¾	.08¾	.10¾
Perilla, drs, NY ... lb.	.19	nom.	.19	.21	.09½	.16½
Tks, Coast ... lb.	.18	nom.	.18½	.20	.089	.15¾
Pine, see Pine Oil, Chem. Sec.						
Rapeseed, blown, bbls, NY lb.	.17	.17½	.17	.17½	.14	.17½
Denatured, drs, NY .. gal.	1.00	1.05	1.00	1.05	.80	1.05
Red, Distilled, bbls ... lb.	.07½	.08½	.07½	.09½	.06¾	.09½
Tks ... lb.	...	.07	.07	.08	.064	.08½
Sardine, Pac Coast, tks .. gal.	.40	nom.	.37	.39	.24	.38
Refined alkali, drs ... lb.	...	.079	...	.081	.062	.082
Tks ... lb.	...	.073	...	.075	.056	.076
Light pressed, drs ... lb.	...	.073	...	.075	.056	.076
Tks ... lb.	...	.067	...	.069	.05	.07
Sesame, white, dom ... lb.	.16	nom.	.11½	.11¾	.09	.12
Soy Bean, crude						
Dom, tks, f.o.b. mills .. lb.	.06	nom.	.06	.06¼	.04½	.06½
Crude, drs, NY ... lb.	...	.06¼	.06¼	.07¾	.05⅛	.07⅝
Ref'd, drs, NY ... lb.	.08	.08¾	.07¾	.08½	.06⅜	.09
Tks ... lb.	.07¼	.07¾	.07	.07⅝	.05¾	.07¾
Sperm, 38° CT, bleached bbls, NY ... lb.	...	.105	...	.105	.09	.103
45° CT, blchd, bbls, NY, .. lb.	...	.098	...	.098	.083	.096
Stearic Acid, double pressed. dist bgs ... lb.	.10½	.11½	.10½	.13	.10	.13½
Double pressed saponified bgs ... lb.	.10¾	.11¾	.10¾	.13¾	.10¼	.13¾
Triple pressed dist bgs lb.	.13¼	.14¼	.13¼	.16½	.12¾	.16½
Stearine, Oleo, bbls ... lb.	.06	.06¼	.06	.06½	.05½	.12
Tallow City, extra loose .. lb.	...	.05	.04¾	.05⅜	.04⅜	.07
Edible, tierces ... lb.	...	.05⅜	.05⅛	.05¾	.04½	.07¾
Acidless, tks, NY ... lb.	...	.07¾	.07½	.08	.07	.09¼
Turkey Red, single, drs ... lb.	...	.082	.082	.09	.06	.08⅝
Double, bbls ... lb.	...	.11	.11	.12¾	.08¾	.11¼
Whale:						
Winter bleach, bbls, NY lb.	...	095	...	.095	.075	.095
Refined, nat, bbls, NY .. lb.	...	.091	...	.091	.071	.091

BOOKLETS AND CATALOGS

Chemicals

A169. Chemicals by Glyco; A 96-page booklet listing, describing, and giving suggested uses for many chemicals such as glycol and glycerol esters, emulsifying agents, synthetic resins, wetting and foaming agents, synthetic waxes, solvents, deodorizing agents, plasticizers, etc. Also gives suggested formulae, terms of sale, standard size containers and index of chemicals by Glyco. Glyco Products Co., Inc.

A170. Cleaners for Industry; Illustrated booklet on application of alkaline cleaning to various types of industry. Pennsylvania Salt Manufacturing Co.

A171. Crush Resistance of Textile Fabrics; Outlines process for crush resistance with RHonite Powder 609. Rohm & Haas Co.

A172. Fabricating Processes for Vinylite Resins; Fabricating processes for use with this type of resin are explained, some in detail and others outlined. Enough information is given about each processing method to illustrate all variances from the usual processing operations. Carbide and Carbon Chemicals Corp.

A173. Ferrisul; 16-page booklet describing the use of Ferrisul (Monsanto commercial grade anhydrous ferric sulfate) in the treatment of water, sewage and industrial wastes. Monsanto Chemical Co.

A174. Porcelain Enamel Colors and Color Matching; Describes method of matching a large number of colors with a small color inventory. Includes tables showing factors which affect color, suggests simple devices to be employed in achieving good color matching results, and shows samples. The Porcelain Enamel & Manufacturing Co.

A175. Synthesis of Macrocyclic Compounds; describes depolymerization or radical-interchange method. Eastman Kodak Co.

A176. The Merck Report; April, 1940. Contains articles on "Recent Advances in the Chemistry of Natural Products," "Silicosis," "Merck Announces Synthesis of Pantothenic Acid," and several other articles devoted to medicine and pharmacy. Merck & Co.

A177. The Neoprene Notebook; "Chemical Components of the Oil Govern Swelling of Neoprene Compounds," also number of short items on applications of neoprene. E. I. du Pont de Nemours & Co.

A178. The Pioneer; March, 1940. Brief items on various new developments. Electro Bleaching Gas Co. and Niagara Alkali Co.

A179. The Test Tube; March, 1940. In this issue, "Hamstringing the Employee's Future," "War's Impact on Chemicals," and other short items. Thompson-Hayward Chemical Co.

A180. White Oils and U.S.P. Petrolatums; Describes the refining of white mineral oils, gives U.S.P. specifications, methods of storage, and describes uses in several industries. Esso Marketers.

Equipment—Containers

E247. All-Iron Gate Valve; Folder describing low-pressure, all-iron gate valves for water gas, coke oven, chemical and power plants, and other industrial applications. Koppers Company.

E248. Alloy Metals Review; Among the several subjects discussed are Silicon-Molybdenum-Vanadium Steels, Nitriding High-Speed Steels, Molybdenum and Vanadium in Chromium Steels, A Metallurgical Survey of Machine Cutting Steels. High Speed Steel Alloys, Ltd.

E249. Blue Book, Part V; Technical data and full specifications regarding line of H-B thermometers, hydrometers, and thermo-hydrometers. H-B Instrument Co., Inc.

E250. Broadside EN-0820; Tells how L&N instruments may be used to advantage in pulp and paper mills. Leeds & Northrup Co.

E251. Calrod Immersion Heaters, Strip Heaters, Thermostats, Unit Heaters; Several bulletins giving data, illustrations, and prices of various types of the above named products. General Electric Co.

E252. Conical Dry Blender; Folder describing and illustrating newly designed piece of equipment for rapid and homogeneous blending. The Patterson Foundry & Machine Co.

E253. Flanging Pressing; 132-page manual. Prefaced by a history of machine spinning, manual gives essential data for flanged only heads, standard flanged and dished heads, A. P. I.—A. S. M. E. code heads, etc. Lukens Steel Co.

E254. G-E Glyptal No. 1294; Bulletin giving information on new welding aids to prevent adhesion of weld spatter and to provide protection against corrosion on surfaces which may not be accessible after welding, such as the overlapped edges of a lap joint. General Electric Co.

E255. Materials Handling Equipment; 56-page catalog covering over 175 of the most important items of materials handling equipment. Clearly described and pictured are many types of lift trucks, portable elevators, storage racks, and many more pieces of equipment for specific uses. Lewis-Shepard Sales Corp.

E256. Quick Selector Catalog; 64-page, enlarged edition prepared to facilitate the user of electrical equipment in selecting the correct apparatus for any motor, lighting, or feeder circuit. Westinghouse Electric and Mfg. Co.

E257. Safety Equipment; Large 128-page catalog of almost every type of safety device to protect workers against the hazards of accidental injury. The Boyer-Campbell Co.

E258. Stabilflo Valves; Illustrated folder describes rugged, but extremely accurate, valve for process control. A semi-logarithmic scale compares the flow curves of the stabilflo valve with other valves. The Foxboro Co.

E259. Steam Traps; 18-page booklet listing features of this equipment. Gives construction details, operation, applications and recommended piping diagrams. W. H. Nicholson & Co.

E260. Steel Plate Fabrication; 42-page catalog containing: "Downington Facilities, Typical Downington Fabrications, Facts about A.S.M.E. Code, Metallurgically Speaking—by Dr. T. H. Nelson, Analysis of S.A.E. Steels." Also several specification tables. Downington Iron Works.

E261. Technical Data Card No. 6; Presents briefly-summarized data relating to application of B&W Croloys and other tubular material for high temperature service. Data are given on fifteen different materials. Babcock & Wilcox Tube Co.

E262. Tenite; 28-page book, contains a general description of the properties and uses of this plastic. Accompanying the text are illustrations in color of some of its outstanding applications. Tennessee Eastman Corp.

E263. Tenite Molding; 40-page technical handbook on the methods employed in molding Tenite articles. Contains discussions of different types of molds, mold construction, molding temperatures, and molding pressures suitable for use with Tenite. Diagrams and detailed explanations of 8 typical mold designs are included. Tennessee Eastman Corp.

E264. Tenite Specifications; This book gives specific data on the physical properties of Tenite for the formulas and flows regularly supplied. This information is presented in tabular and graph form, with supplementary paragraphs of explanation and description. Tennessee Eastman Corp.

E265. The Crown; March, 1940. Among contents are, "Bottled Soft Drinks Reach Billion Dollar Sales," "Selling Certified Milk," "Newsprint from Newfoundland," "Lithography—Part 3" by S. Ira Wilbur, Sc.D., "The Story of Rubber—Part 3" by Giles B. Cooke, Ph.D. Crown Cork & Seal Co.

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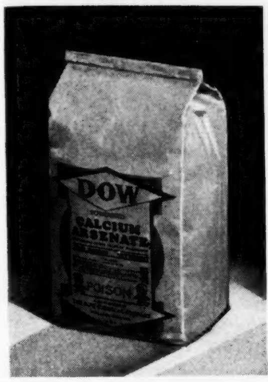

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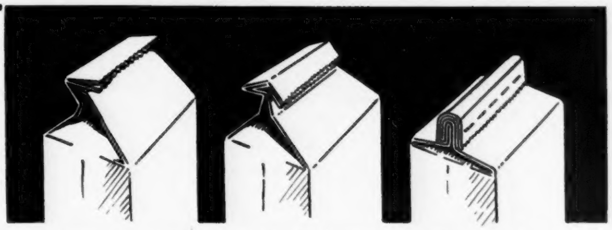

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"We"—Editorially Speaking

Chester H. Penning, who authored the article on Kingsport in this issue, is a native of Ohio. Before going to Tennessee in 1931, he resided in Delaware (Du Pont), Maryland (Chemical Warfare Service), District of Columbia (Tariff Commission), New York (Chemical Catalog) and Alabama (Swann Chemical). In his present position in Cellulose Products Sales for Tennessee Eastman Corporation he has had an opportunity to observe the rapid growth of industry in the northeastern corner of his adopted state.

June is the month for roses and weddings, but to many thousands of graduates it is also the beginning of a hunt for a job. We happened to be in Gordon MacKe'can's office (Innis, Speiden's vice-president in charge of sales) a few days ago discussing the problems facing our youth today and he showed us two very interesting letters, one from a father to his son and the son's reply. We regret that space does not permit publishing both letters in full, but we do feel that we would be very remiss at this time of the year in our duty if we did not at least give you certain portions.

Father to son:—

Your birthday is a good time to give some thought to locating a job. May I suggest you sit down and get on paper your ideas about a job. Your thinking might take this form.

1. What is your ultimate aim? (I do not mean a specific situation but a philosophy of life.)
2. What kind of work would you find most enjoyable through life?
3. Does any particular industry appeal to you?
4. What things do you wish not to do?

Son to his father:—

After analyzing myself, my personality, my capabilities, and my limitations I think that I would be happiest in some kind of contract work or salesmanship for the following reasons:

1. There is a security in a selling job. You have said yourself that a good salesman ought never to be out of a job, and this seems to come close to touching the truth. I was reading an article the other day the gist of which amounted to the fact that there are plenty of good jobs open to the capable. The article mentioned in particular selling jobs. There are plenty of salesmen floating around, but a dearth of good ones, and big jobs await for the asking if one is willing to sacrific the pleasure of immediate gain for the more monotonous task of educating oneself properly, slowly but surely.

2. Out of this last statement grows my second reason—namely that this field offers unlimited opportunity. Results are tangible, not only in a remunerative way to your own eyes, but also to the demanding eye of your superiors. Therefore, assuming that one possesses the ability to sell, the sky ought to be the limit as far as reward goes. In addition, the chances for getting ahead increase proportionately with the amount of business you can return.

3. There is a degree of freedom found in selling not found in jobs whose nature demands a great deal more routine work. For the eager and ambitious, the way lies open to advancing as rapidly as conditions and the desire of the person allows. In addition, the scene is constantly shifting from day to day. One keeps meeting new people, in varied backgrounds, relieving the monotony found in jobs which require the fulfilling of the same duties day in and day out.

4. There is a demand for competent salesmen. It seems to me that the day of the hard drinking, glib-tongued, high pressure salesmen is over, and in their place there comes the cry for men of character, who will stick to the job and possess a genuine ability to sell. (I don't intend to be smug here at all, but I hope I do have strength of character.)

5. I would derive a great deal of personal satisfaction from selling a commodity, because I like to see my results not only in a tangible form, but also from the fact that I like dealing with people, and trying to convince them to come around to my way of thinking.

We have been carrying on a most interesting correspondence with members of the firm of Bang & Co., Aktiebolag, located in Helsingfors, Finland. Much of it has been devoted to a vivid description of what happened to that brave country during the recent Soviet invasion. Believe us when we say that it does not make very pleasant reading aside from the following:

"Before finishing this letter we just want to add that our firm during the difficult months of our war has been served very efficiently by the American suppliers of chemicals with whom we have been cooperating. All goods have been of good quality and shipments have taken place according to promises given."

American chemical industry has added a great deal to its enviable reputation during the past nine months by its fairness and restraint. It has taken care of the legitimate needs of actual consumers and established dealers without the slightest attempt to profiteer. It has maintained prices for thousands of items at pre-war levels despite higher labor, raw material and manufacturing costs. There are ugly rumors, however, of a number of fly-by-night operators who, appreciating the importance of the chemical industry and believing that a golden opportunity for speculation exists, are attempting to force their way into the industry's merchandising set-up. These carpet-baggers, with no previous chemical background and with no real knowledge of the industry, are not needed and unless we are to repeat much of the folly of 1914-1921 the industry as a whole must exercise even greater diligence than heretofore. We particularly want to stress to our readers in foreign countries the necessity of knowing something of the reputation of those with whom they plan to do business.

Fifteen Years Ago

From our files of May, 1925

Frank Garvan, president of Chemical Foundation, is the main speaker at monthly dinner of the Salesmen's Association of the American Chemical Industry, on May 11, at the Builder's Exchange, N. Y. City.

Southern Section of American Association of Textile Chemists and Colorists holds annual meeting at the Piedmont Hotel, Atlanta.

American methanol producers draw up an application to the Secretary of the Treasury to invoke the protection of Anti-Dumping Law against synthetic methanol from Germany.

N. Y. Chapter of the American Institute of Chemists elects following officers: Arthur E. Hill, president; Charles R. Downs, vice-president; Ralph S. Doubleday, secretary-treasurer.

At its annual meeting Chemists' Club elects the following officers: president, Dr. K. G. Mackenzie; resident vice-president, L. V. Redman; non-resident vice-president, E. D. Weidlein; treasurer, A. G. Robinson; secretary, J. H. W. Randall.

Tetra-ethyl lead plant of E. I. du Pont de Nemours & Co. at Deepwater, N. J., to re-open soon.

F. M. Becket, chief metallurgist of the Union Carbide & Carbon Research Laboratories, elected president of the American Electrochemical Society at the 47th meeting at Niagara Falls.

Herman A. Metz offers prize of $100,000 for a process for making synthetic opium at a price low enough to wipe out poppy-growing as an industry.

An advisory committee from the chemical industry has been named by Secretary Hoover to co-operate with the Department of Commerce in developing the industry.

5/18/40

State of Chemical Trade

Current Statistics (April 30, 1940)—p. 57

WEEKLY STATISTICS OF BUSINESS

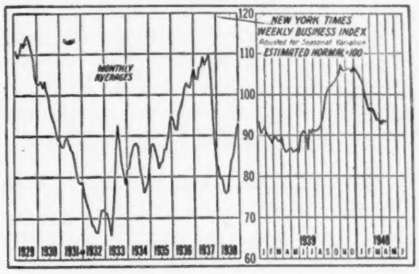
Week Ending	Carloadings 1940	Carloadings 1939	Carloadings % of Change	Electrical Output* 1940	Electrical Output* 1939	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Fert. Ass'n Price Indices Fert. Mat.	Fert. Ass'n Price Indices Mixed Fert.	†Labor Dept. All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Mar. 30	628,278	600.691	+ 4.6	2,422,287	2,209,971	+ 9.6	79.7	94.3	49.9	72.7	78.4	76.3	77.2	61.7	93.8	84.1
April 6	602,697	534,952	+12.7	2,381,456	2,173,510	+ 9.6	79.3	94.5	50.3	72.4	78.4	76.2	76.9	61.3	93.0	83.7
April 13	618,810	547,179	+13.1	2,417,994	2,170,671	+11.4	81.2	94.5	51.6	72.4	78.4	77.3	76.9	60.9	93.3	84.5
April 20	628,342	557,867	+12.6	2,421,576	2,199,002	+10.1	81 1	94.5	53.6	72.7	78.1	77.7	77.4	60.0	93.0	84.8

* K.W.H. 000 omitted; † 1926-1928 = 100.00.

MONTHLY STATISTICS

CHEMICAL:	March 1940	March 1939	Feb. 1940	Feb. 1939	Jan. 1940	Jan. 1939
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	......	169,952	212,719	169,769	235,023	181,386
Consumpt. in mfr. fert.	......	119,081	158,592	138,273	182,160	142,451
Stocks end of month	......	94,529	93,132	92,163	92,040	92,850
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	20,983,157	17,438,065	20,381,272	14,650,062	20,655,547	17,067,004
Comp. denat. prod., wine gal.	413,609	504,865	453,848	339,343	1,303,991	474,140
Removed, wine gal.	403,640	480,384	412,653	361,310	1,318,113	444,784
Stocks end of mo., wine gal.	340,798	456,116	327,350	432,644	287,163	455,271
Spec. denat. prod., wine gal.	9,110,798	7,110,718	8,005,829	6,106,587	9,063,786	6,352,405
Removed, wine gal.	9,094,261	7,097,868	8,092,437	6,197,035	8,828,451	6,276,747
Stocks end of mo., wine gal.	1,051,625	837,796	1,038,272	827,846	1,129,653	923,449
Ammonia sulfate prod., tons *a*	56,059	46,670	53,884	41,780	60,393	45,756.5
Benzol prod., gal. *b*	9,952,000	8,063,000	9,695,000	7,141,000	11,424,000	7,788,000
Byproduct coke, prod., tons *a*	3,037,336	1,705,874	4,016,742	3,077,854	4,707,068	3,366,956
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	789,307	917,274	723,107	712,212	878,316	641,575
Sheets, ship., lbs.	607,267	818,229	594,261	698,393	749,002	685,139
Rods, prod., lbs.	231,297	311,893	246,298	267,790	291,806	233,530
Rods, ship., lbs.	255,511	290,064	257,399	230,625	275,316	220,464
Tubes, prod., lbs.	69,036	85,841	46,797	69,293	68,702	48,284
Tubes, ship., lbs.	61,739	62,749	66,739	48,273	58,805	50,809
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	550,138	1,077,560	636,834	988,719	857,277	896,122
Shipments, lbs.	588,516	1,029,302	655,076	1,014,295	751,429	855,778
Molding comp., ship.; lbs.	1,021,579	809,718	877,685	770,006	1,023,808	682,482
Methanol (Bureau of the Census)						
Production, crude, gals.	506,937	364,500	446,815	336,157	457,271	351,814
Production, synthetic, gals.	3,462,946	2,406,564	3,782,402	2,267,339	3,452,677	2,462,884
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	......	3,108,289	2,744,749	3,005,939	2,909,785	2,637,337
Heavy goods, ship., linear yds.	......	2,396,423	2,116,841	2,113,036	2,151,034	2,147,444
Pyroxylin spreads, lbs. *c*	......	5,401,941	4,930,415	5,079,315	2,131,394	5,270,462
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	......	......	$16,670	$11,958	$20,432	$8,984
Crude sulfur *d*	......	$756	$849	$575	$1,001	$555
Coal-tar chemicals *d*	......	$961	$2.421	$877	$2,895	$1,015
Industrial chemicals *d*	......	$2,261	$4,727	$1,799	$4,189	$1,770
Imports						
Chemicals and related prod. *d*	......	......	$5,422	$6,099	$6,670	$6,742
Coal-tar chemicals *d*	......	$1,122	$419	$1,794	$1,182	$1,817
Industrial chemicals *d*	......	$1,459	$1,136	$1,146	$1,408	$1,120
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	122.5	116.0	121.0	113.4	121.0	113.2
Other than petroleum	122.8	115.7	121.1	112.4	120.9	112.0
Chemicals	134.7	118.6	135.2	118.1	135.8	117.5
Explosives	107.8	84.9	105.5	84.3	103.5	85.6
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	132.1	120.6	131.3	118.9	131.0	118.8
Other than petroleum	131.0	117.3	130.2	114.8	130.3	113.9
Chemicals	157.7	133.3	158.2	132.0	159.8	130.2
Explosives	128.8	95.9	127.5	97.1	120.9	95.1
Price index chemicals*	85.1	84.8	81.0	79.4	80.9	79.7
Chem. and drugs*	81.4	77.7	78.1	76.3	78.1	76.7
Fert. mat.*	70.6	68.0	72.9	69.3	74.0	70.2
Paint and paint mat.	87.2	81.5	86.8	80.5	87.2	81.0
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	......	85,095	56,000	85,542
Ammonium sulfate	......	......	......	437	12,315	2,096
Total phosphate rock	......	......	......	62,068	20,590	68,897
Total potash fertilizers	......	......	......	2,132	724	2,144
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	......	110,847	148,000	145,995
Ammonium sulfate	......	......	......	6,746	6,492	7,611
Sodium nitrate	......	......	......	54,552	56,627	68,854
Total potash fertilizer	......	......	......	6,795	41,798	20,186

INDUSTRIAL TRENDS



Business: In general business activity held steady pace during past month. There were some gains, a few losses. Price indexes increased generally. Industrial production indexes showed some declines.

Steel: It appears, at last, that steel operations are holding their own. There were slight rises in production at the beginning of the month, then small declines and toward end another rise. Although small increases are expected there is not much evidence to indicate any great change in near future. Increased steel scrap buying is one factor that lends credence to these expectations. In some quarters it is felt that if a large pickup is to come it will be brought about by export business rather than domestic.

Commodity Prices: Price indexes which declined during March advanced somewhat during April. Department of Labor's All Commodity index increased from 77.9 on March 23 to 78.5 on April 20. Farm products and foods were leading gainers, each picking up about 2 points. Chemicals and Drugs increased slightly. Textile products and building materials met with small declines.

Electric Output: The production of electric power is still holding at an average of about 10% better than last year. However, total for April was somewhat below March figures.

Retail Trade: Retail sales, which declined after Easter pickup, have recovered. The trade is still irregular however. For country as a whole, there is an estimated 4-7% gain over 1939, with South leading other sections of the country.

Wholesale Trade: Sales of wholesalers, based upon reports from 2,857 firms representing all parts of the

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country, were at about same level in March as in the same month a year ago. Wholesalers reported dollar sales amounting to $205,256,000 in March, 6.4% over February, 1940.

Automotive: Factory sales of automobiles during first quarter of this year were higher than during any corresponding three months' period since 1929. Total factory sales in March were 423,299. This compares with total of 403,627 vehicles in February and 371,949 in March 1939. Despite earlier expectations of a decline, output for April is expected to approximate or even exceed that of March.

Carloadings: Revenue freight loadings for three weeks prior to April 20 have averaged a bit under comparable figure for preceding month. However, during this period loadings were about 10.75% ahead of 1939, whereas preceding month averaged only about 5% ahead of 1939.

Textiles: Activity in woolen textile industry continues to decline. Cotton-mill activity also declined considerably but remained at somewhat higher level than year ago. Silk mill operations continued at exceptionally low level, although takings of raw silk during April was slightly higher than general trade expectations.

Outlook: Industrial and trade activities show no very significant features. Steel, which has had general downward trend, seems to have reached bottom. Toward end of April there was some increase and expectations of further small rises. Production and consumption of goods are getting back into balance after six or more months of disequilibrium. Three industries—aircraft, toolmaking, and shipbuilding are at levels high above 1937 with prospects of going still higher. Railroad carloadings did not take drop experienced in similar period last year and some increase is looked for. Flow of industrial orders to manufacturers began to quicken somewhat after middle of April. As a result Federal Reserve Board index of industrial production, which has been steadily declining, is not expected to take another drop.

Although these trends are not spectacular and no great pickup is expected, it is felt that they indicate a check in the decline and beyond that belief forecasting is hazardous.

During the past month American industry has been definitely obliged to accept the European war on a very realistic basis. The "phoney war" in its newest phase promises to be long and destructive and one which will have important consequences for American industry.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	March 1940	March 1939	Feb. 1940	Feb. 1939	Jan. 1940	Jan. 1939
Superphosphate e (Nat. Fert. Association)						
Production, total	296,798	255,223	318,788	273,010	391,803	276,440
Shipments, total	594,321	607,094	269,588	259,568	213,248	186,881
Northern area	165,041	184,525	88,574	86,467	85,647	67,881
Southern area	429,280	422,569	181,014	173,101	127,601	118,799
Stocks, end of month, total	1,739,663	1,615,376	2,006,283	1,948,220	1,913,279	1,898,213
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,639,766	1,581,205	717,752	684,765	428,643	450,581
Total, 12 southern	1,538,065	1,478,041	676,256	628,996	380,009	438,805
Total, 5 midwest	101,701	103,164	41,496	55,769	48,634	12,476
Fertilizer employment *i*	153.5	145.7	109.3	77.2	102.8	102.9
Fertilizer payrolls *i*	113.8	104.4	83.7	98.2	82.3	75.2
Value imports, fert. and mat. *d*	......	......	......	$2,417	$3,260	$3,427
GENERAL:						
Acceptances outst'd'g *f*	$229	$245	$233	$248	$229	$255
Coal prod., anthracite, tons	3,773,000	3,604,000	3.546,000	4,114,000	5,622,000	4,952,000
Coal prod., bituminous, tons	35,400,000	35,438,000	39,105,000	34,134,000	46,940,000	37,750,000
Com. paper outst'd'g *f*	$233	$191	$226	$195	$219.4	$195.2
Failures, Dun & Bradstreet	1,197	1,322	1,042	1,202	1,237	1,567
Factory payrolls *i*	97.9	87.6	97.8	86.0	98.3	83.2
Factory employment *i*	100.7	94.3	101.4	93.6	101.5	89.3
Merchandise imports *d*	......	......	$199,775	$158,035	$241,897	$178,201
Merchandise exports *d*	......	......	$338,639	$216,157	$358,000	$210,000
GENERAL MANUFACTURING:						
Automotive production	423,299	371,946	403,627	303,220	432,101	342,168
Boot and shoe prod., pairs	29,501,279	37,484,294	31,324,157	35,924,582	33,884,856	33,561,000
Bldg. contracts, Dodge *j*	$272,178	$300,661	$200,574	$220,197	$196,191	$251,673
Newsprint prod., U. S. tons	85,143	79,929	81,455	70,868	84,126	77,264
Newsprint prod., Canada, tons.	251,279	220,648	231,823	200,631	251,032	208,382
Glass Containers, gross‡	4,606	4,128	4,128	3,389	4,263	3,589
Plate glass prod., sq. ft.	14.302.978	11.866.817	13,122,000	10,165,401	17,254,241	12,209,080
Window glass prod., boxes	1,107,437	912,301	1,099,049	808,585	1,413,544	943,184
Steel ingot prod., tons	4,236,050	3,814,013	4.374.625	3,347,288	5,619,000	3,174,000
% steel capacity	63	56.3	69.62	54.72	83.18	52.48
Pig iron prod., tons	3,270,499	2,681,969	3,311,480	2,307,409	4,032,022	2,175,423
U.S. cons'pt. crude rub., lg. tons	......	50,165	......	42,365	54.978	46,234
Tire shipments	4,351,657	4,564,794	4,118,030	3,731,263	4,276,512	4,148,783
Tire production	5,031,153	5,091,006	4,910,754	4,308,526	4,976,548	4,546,427
Tire inventories	10,836,239	9,962,917	10,156,918	9,474,660	9,388,742	8,863,319
Cotton consumpt., bales	626,331	649,940	662,659	562,580	730,143	598,132
Cotton spindles oper.	22,555,036	22,503,480	22,803,796	22,532,814	22,872,414	22,496,544
Silk deliveries, bales	21,685	37,863	22.485	33,219	29,506	40,816
Wool Consumption *s*	......	30.9	31.4	31.1	34.4	30.9
Rayon deliv., lbs.	29,500,000	26,500,000	29,500,000	25,600,000	31,900,000	27,100,000
Hosiery (all kinds) *t*	......	10,433,355	8,975,925	9,047,217	9,343,933	8,743,677
Rayon employment *i*	309	303.8	313.3	305.9	313.5	300.3
Rayon payrolls *i*	316	286.9	321.3	287.8	320.4	283.3
Soap employment *i*	82.5	80.6	84.4	79.9	83.5	79.1
Soap payrolls *i*	99.2	96.2	100.3	94.9	100.3	94.9
Paper and pulp employment *i*	112.7	105.9	113.2	106.3	114.1	105.5
Paper and pulp payrolls *i*	115.0	105.6	117.3	105.2	117.6	102.7
Leather employment	84.2	87.3	86.5	88.3	87.4	87.3
Leather payrolls *i*	80.5	85.2	83.6	87.3	86.1	85.8
Glass employment *i*	106.3	96.4	102.3	95.2	105.6	95.3
Glass payrolls *i*	113.3	100.0	108.3	97.9	113.1	96.6
Rubber prod. employment *i*	87.4	82.8	88.2	81.5	90.0	81.3
Rubber prod. payrolls *i*	88.3	83.2	88.3	81.0	94.1	82.2
Dyeing and fin. employment *i*	128.7	127.3	129.7	128.0	129.7	124.4
Dyeing and fin. payrolls *i*	108.8	110.7	108.1	111.9	109.5	106.2
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)	......	......	......	54.7	59.3	56.2
Gasoline prod., *p*	......	......	......	......	52,351	48,119
Cottonseed oil consumpt., bbls.	......	......	......	217,781	......	229,666
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments	$31,592,093	$32,888,357	$26,537,573	$25,399,464	$28,666,635	$25,166,042
Trade sales (580 establishments)	$16,144,606	$17,656,995	$13,042,764	$13,145,314	$13,549,867	$12,406,701
Industrial sales, total	$12,639,821	$12,112,220	$11,146,277	$10,019,901	$12,317,340	$10,269,334
Paint & Varnish, employ. *i*	123.5	119.7	123.3	117.2	123.5	116.5
Paint & Varnish, payrolls *i*	130.1	122.7	129.3	117.9	128.5	115.3

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business. U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940.

Chemical Finances
April, 1940—p. 56

Hercules Powder Net Best in Decade

Hercules Powder Co. reports the largest three months' earnings in over a decade for the quarter ended March 31.

Net profit for the period was $1,742,573 after allowing for depreciation and federal taxes, which is equal after deducting preferred dividends to $1.22 a share on 1,316,710 shares of common stock.

This compares with $1,087,322 or 73 cents on the same number of shares in the March, 1939, quarter, and with $1.18 a share earned in the December, 1939, period.

Victor Chemical Earnings Down Slightly

Victor Chemical Works reports for quarter ended March 31, 1940, net profit of $226,990 after depreciation and federal income taxes, equal to 32 cents a share on 696,000 shares (par $5) of capital stock.

This compares with $233,615 or 33 cents a share in March quarter of previous year.

Atlas Powder Nets $1.11

Report of Atlas Powder Co. and subsidiaries for quarter ended March 31, 1940, shows net profit of $364,696 after depreciation, federal income taxes, etc., equal after preferred dividends paid, to $1.11 a share on 250,288 no-par shares of common stock, excluding shares held by company.

This compares with $220,707 or 54 cents a share on 249,163 common shares in quarter ended March 31, 1939.

Net sales for the quarter amounted to $4,472,384 against $3,646,937.

Dividends and Dates

Name	Div.	Stock Record	Payable
Atlas Powder Co.			
5% pf. quar.	$1.24	Apr. 19	May 1
Celanese Corp. of Amer.			
St. div. (1 sh. for ea. 40 held)	...	Mar. 15	May 1
7% 1st pf.	$3.50	June 14	June 30
7% prior pf. quar.	$1.75	June 14	July 1
Colgate-Palmolive-Peet Co., pf.	$1.2514	June 5	June 30
Commercial Alcohols, Ltd.	10c	Apr. 15	May 1
Fansteel Metallurgical Corp.			
pf. quar.	$1.25	June 15	June 30
pf. quar.	$1.25	Sept. 15	Sept. 30
pf. quar.	$1.25	Dec. 14	Dec. 18
Freeport Sulphur Co. (quar.)	25c	May 14	June 1
Imperial Chem. Industries			
Am. deposit receipts (final)	5%	Apr. 25	July 8
Lindsay Light & Chemical Co.	15c	May 3	May 13
Monsanto Chemical Co.			
pf. A & B (s.a.)	$2.25	May 10	June 1
National Lead Co.,			
pf. A, quar.	$1.75	May 31	June 15
pf. B, quar.	$1.50	Apr. 19	May 1
Procter & Gamble			
Co., quar.	50c	Apr. 25	May 15
Extra	50c	Apr. 25	May 15
Sharp & Dohme, Inc.			
pf. A, quar.	87½c	Apr. 16	May 1
United Chemicals, Inc.	†75c	May 10	June 1
West Virginia Pulp & Paper Co. 6% pf. quar.	$1.50	May 1	May 15
Westinghouse Electric & Mfg.	87½	May 7	May 29
Participating pf.	87½c	May 7	May 29

Du Pont Earns $2.04

Report of E. I. du Pont de Nemours & Co. and wholly-owned subsidiaries for quarter ended March 31, 1940, subject to year-end adjustments, shows net profit of $23,727,188 after depreciation, obsolescence, interest and federal income taxes, comparing with $19,075,376 in March quarter of previous year.

After deducting dividends on preferred stock, and including $701,569 company's equity in undivided profits of controlled companies not wholly owned, there was a balance available for common stock in first quarter of 1940 of $22,528,801 equivalent to $2.04 a share.

In first quarter of 1939 balance available for common stock, including $235,979 company's proportion of undivided profits of controlled companies not wholly owned, was $17,109,459, equal to $1.55 a share.

Union Carbide Has Record-Breaking Net

Net earnings of Union Carbide & Carbon Corporation in first quarter of this year reached an all-time first quarter record of $10,468,706, equivalent to $1.13 a share on the capital stock.

In prior years the highest first quarter earnings were $9,947,712 in 1937, equal to $1.10 a share on the number of shares then outstanding. The outstanding capital stock was increased in 1939 by the acquisition of the Bakelite Corporation.

In the first quarter of 1939 net earnings on income was $5,293,885, or 58c a share on the capitalization outstanding at that time.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1940	Net income 1939	Common share earnings 1940	Common share earnings 1939	Surplus after dividends 1940	Surplus after dividends 1939
Abbott Laboratories:							
March 31 quarter	y$2.05	$745,491	$617,835	h$.96	h$.88	......	......
Twelve months, Mar. 31	y 2.05	2,119,150	1,770,831	h2.71	h2.50	......	......
Air Reduction Co.:							
March 31 quarter	§ 1.00	1,442,990	1,027,255	h.53	h.40	......	......
American Cyanamid Co.:							
March 31 quarter	§ .60	1,675,602	1,040,478	.62	.39	......	......
Atlas Powder Co.:							
March 31 quarter	y 3.25	364,696	220,707	1.11	.54	......	......
Canadian Industrial Alcohol Co.:							
Six months, Feb. 29	y .15	87,963	116,812	.08	.10	......	......
Commercial Solvents Corp.:							
March 31 quarter	f ...	513,560	198,042	.19	.07	......	......
Consolidated Chemical Industries:							
March 31 quarter	...	215,186	102,785	b.60	a.37	......	......
Corn Products Refining Co.:							
March 31 quarter	3.00	2,361,538	2,003,358	.76	.62	$33,997	d$324,183
du Pont de Nemours & Co., E. I.:							
March 31 quarter	y 7.50	23,727,188	19,075,376	j2.04	j1.55	2,477,914	3,046,857
Eastman Kodak Co.:							
52 weeks, Dec. 30	k 6.00	21,537,577	z17,041,798	h8.55	h7.41	6,649,195	3,166,330
Freeport Sulphur Co.:							
March 31 quarter	y 1.50	861,233	316,464	1.08	.40	......	......
Lindsay Light & Chemical:							
March 31 quarter	y .40	30,789	16,563	.44	.21	... .	....
Procter & Gamble Co.:							
March 31 quarter	y 3.00	7,686,610	6,586,778	h1.18	h1.00	......	......
‡‡Nine months, Mar. 31	y 3.00	22,273,148	18,469,039	h3.40	h2.80	......	......
Texas Gulf Sulphur Co. Inc.:							
March 31 quarter	2.00	2,045,008	1,434,465	.53	.37	125,008	d485,535
Twelve months, Mar. 31	2.00	8,458,025	6,558,411	2.20	1.71	......	......
Union Carbide & Carbon:							
March 31 quarter	y 2.10	10,468,706	5,293,885	h1.13	h.58	......	......
United Chemicals, Inc.:							
March 31 quarter	f ...	38,922	31,401	...	...	......	......
Victor Chemical Works:							
March 31 quarter	y 1.45	226,990	233,615	.32	.33	......	......
Westvaco Chlorine Products Corp.:							
March 31 quarter	y 2.05	360,596	245,063	.85	.51	......	......

a On first preferred stock; *b* On second preferred stock; *c* On combined Class A and Class B shares; *d* Deficit; *f* No common dividend; *j* On average number of shares; *k* For the year 1939; *p* On preferred stock; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; n Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss.

Price Trend of Representative Chemical Company Stocks

	Apr. 6	Apr. 13	Apr. 20	Apr. 27	Net gain or loss last mo.	Price on Apr. 29 1939	1940 High	1940 Low
Air Reduction Co.	52⅝	50½	49½	48⅜	—4¼	49¼	58⅛	48
Allied Chemical & Dye	179	180½	177	179½	+½	157½	182	171
Amer. Agric. Chem.	19¼	19½	18½	18⅜	—⅞	16	21	18¼
Amer. Cyanamid "B"	39¼	39⅛	38⅝	38¼	—1	20½	39⅞	31¾
Columbian Carbon	98	97	95	94	—4	78½	98¾	86
Commercial Solvents	16⅝	15½	15⅝	15	—1⅝	9⅞	16⅝	13
Dow Chemical Co.	169	167	170	170	+1	114½	171	142
Du Pont	188¼	188¼	187¼	188	—¼	140	189¼	175
Hercules Powder	99⅞	96¾	97	98	—1⅞	64⅞	100½	87½
Mathieson Alkali	30⅛	31½	32½	31	+⅞	26	32¾	25½
Monsanto Chem. Co.	113½	114⅞	113	115¾	+2¼	91½	115¾	104
Standard Oil of N. J.	43⅝	42¾	40⅝	42	—1⅝	45	46½	40
Texas Gulf Sulphur	34½	35¼	34⅞	34⅝	+⅛	28⅛	35¾	32¾
Union Carbide & Carbon	84⅞	82	80⅞	83	—1⅞	72¼	88⅜	78½
U. S. Industrial Alcohol	25⅝	24¼	24⅛	27	+1⅜	15	27	21

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Chemical Stocks and Bonds

April 1940 Last	April 1940 High	April 1940 Low	1939 High	1939 Low	1938 High	1938 Low	Sales (Number of shares) April 1940	Sales (Number of shares) 1940	Stocks	Par $	Shares Listed	Dividends*	Earnings** $-per-share-$ 1939	1938	1937
NEW YORK STOCK EXCHANGE															
68	70¼	67	71½	53	61	46¼	2,100	13,900	Abbott Labs.	No	752,468	$2.05	2.61	2.43	2.51
48⅝	58⅛	48	68	45¼	67⅞	40	30,500	110,700	Air Reduction	No	2,563,992	1.50	1.98	1.47	2.86
180	182	171	200½	151⅛	197	124	10,800	40,100	Allied Chem & Dye	No	2,214,099	9.00	9.50	5.92	11.19
18	21	18	24½	16	28½	22	4,600	12,600	Amer. Agric. Chem	No	627,987	1.30	....	2.23	2.95
7⅜	8¼	6⅝	11⅞	5⅛	15	9	12,100	23,900	Amer. Com. Alcohol	No	280,934	....	.38	—2.05	3.23
34	35½	31½	37	21	31½	20	1,100	6,800	Archer-Dan.-Midland	No	545,416	1.10	....	.43	5.03
77	77	63	71	50	68	36	1,800	8,600	Atlas Powder Co.	No	250,288	3.00	3.82	2.69	4.40
122½	124¾	117	127	116	126¼	105	630	1,480	5% conv. cum. pfd.	100	68,597	5.00	18.94	14.77	20.90
34½	35½	26⅜	30¼	13⅝	26⅝	9	137,200	331,800	Celanese Corp. Amer.	No	1,000,000	.50	3.53	.26	2.04
118¼	119	107½	109⅞	84	96	82	2,790	14,550	prior pfd	100	164,818	7.00	37.72	15.05	27.07
16	20	15¾	18	11½	17	7⅛	49,800	235,200	Colgate-Palm.-Peet	No	1,962,087	1.00	2.74	1.77	—.35
93	98¾	87⅞	96	73	98½	53¾	2,100	10,300	Columbian Carbon	No	537,406	4.50	5.32	5.13	8.31
14⅞	16⅝	13	16	8⅝	12¼	5⅞	151,900	452,400	Commercial Solvents	No	2,636,878	....	.61	—.11	.60
60	65⅛	58½	67½	54⅞	70¾	53	18,600	64,200	Corn Products	25	2,530,000	3.00	3.32	3.18	2.52
178	177⅜	170	177	150	177	162	800	2,400	7% cum. pfd.	100	245,738	7.00	41.18	39.69	32.96
18⅞	23¼	18⅝	32⅜	18	40⅞	25	3,160	9,220	Devoe & Rayn. A.	No	95,000	....	2.05	—1.72	4.05
169¼	171	142	144⅝	101½	141	87⅞	6,300	32,100	Dow Chemical	No	1,034,988	3.00	3.76	3.91	4.15
188½	189¼	175	188½	126¼	154¾	90½	38,500	120,300	DuPont de Nemours	20	11,065,762	7.00	7.70	3.74	7.37
125	126	127	124⅛	112	120½	109½	4,900	26,550	4½% pfd.	No	500,000	4.50	....	87.27	165.48
157	166¾	145⅞	186⅛	138⅛	187	121½	18,500	55,400	Eastman Kodak	No	2,476,013	6.00	8.55	7.54	9.76
174	178	168½	183½	155½	173	157	200	700	6% cum.	100	61,657	6.00	....	281.22	362.45
37¼	38¾	31⅞	36	18¼	32	19⅞	47,200	82,700	Freeport Texas	10	796,380	1.50	....	1.87	3.30
9	10	8¾	10⅞	7	12⅛	6¾	4,000	17,100	Gen. Printing Ink	1	735,960	.80	.94	.62	1.32
17⅝	19¾	16¾	24½	14	28½	13	11,300	41,600	Glidden Co.	No	829,989	.50	1.70	—.29	2.62
44	44⅛	38½	47	34	51½	37	400	4,600	4½% cum. pfd.	50	199,940	2.25	4.27	1.08	12.72
106½	113¼	105	112¾	93	111	76¾	1,600	5,600	Hazel Atlas	25	434,409	5.00	6.64	4.97	6.67
98¾	100½	87½	101½	63	87	42¾	9,300	39,000	Hercules Powder	No	1,316,710	2.85	3.65	1.96	2.97
132	133½	131	135½	128½	135¼	126¾	1,060	2,660	6% cum. pfd.	100	96,194	6.00	60.87	35.31	50.75
25	29	24¾	29½	16¾	30⅜	14⅝	11,300	30,600	Industrial Rayon	No	759,325	.75	1.77	.24	.34
42	47⅝	40	46¼	17½	34½	15	6,300	30,100	Interchem.	No	290,320	.40	4.10	.32	1.44
110¾	113	108	109½	90	98	80	540	3,010	6% pfd.	100	65,661	6.00	24.27	7.39	12.26
2	2⅜	1⅝	3⅝	1½	3⅞	2	8,200	29,300	Intern. Agricul.	No	436,048	....	1.32	.003	.16
34¾	38	32⅛	41	16	29	15	3,000	7,800	7% cum. pfd.	100	100,000	....	1.26	7.01	7.70
29⅞	38⅞	29⅝	55¾	35	57⅝	36⅞	105,600	345,700	Intern. Nickel	No	14,584,025	2.00	2.39	2.09	3.31
36¾	37⅛	34⅝	38	29	30¼	19½	2,200	5,300	Intern. Salt	No	240,000	1.75	1.92	2.29	2.11
23⅛	23¾	21	22½	14½	24	19⅛	1,700	6,200	Kellogg (Spencer)	No	509,213	1.10	1.39	.71	2.81
50	53⅜	48¼	56⅜	36½	58⅜	23¼	17,800	63,300	Libbey Owens Ford	No	2,513,258	2.75	3.21	1.57	4.19
16⅝	18⅜	15½	19	13½	21½	12⅛	6,300	43,100	Liquid Carbonic	No	700,000	1.00	....	1.81	2.37
30½	32¾	25½	37⅜	20¾	36⅞	19¾	17,500	43,100	Mathieson Alkali	No	828,171	1.50	1.12	1.01	1.81
118¾	118¾	104	114¾	85¾	110	67	11,100	55,900	Monsanto Chem.	No	1,241,816	3.00	4.01	2.35	4.40
118	118	116½	121	110	117½	111	190	930	4½% pfd. A.	No	50,000	4.50	54.29	31.51	49.99
121½	121½	118	122½	112	...	...	320	820	4½% pfd. B.	No	50,000	4.50	54.29	31.51	49.99
20¾	22½	19⅛	27½	17⅞	31	17⅛	30,200	104,400	National Lead	10	3,095,100	.87	1.28	.75	.96
167	173⅜	165	173⅛	152	178½	154	700	2,900	7% cum. "A" pfd.	100	213,793	7.00	27.04	20.03	22.86
143½	148½	140	145	132	145½	127	160	1,250	6% cum. "B" pfd.	100	103,277	6.00	55.30	35.97	43.77
12	14¼	11¼	17¾	8½	19½	9⅞	18,200	70,100	Newport Industries	1	620,459	....	.66	—.08	2.22
62½	64⅝	59½	70	50	76¼	40	17,200	58,500	Owens-Illinois Glass	12.50	2,661,204	2.00	3.17	2.02	3.51
69⅝	71¾	65¾	66	50⅝	59	39½	22,200	73,700	Procter & Gamble	No	6,325,087	2.25	3.80	2.59	4.09
114	118½	112⅝	119¾	112	122¼	114	1,030	4,620	5% pfd.	100	169,517	5.00	298.55	101.81	157.05
12¾	13⅛	10⅝	17¼	9⅞	18⅜	10	23,000	69,200	Shell Union Oil	No	13,070,625	.50	.77	.70	1.44
106½	108¼	105	107⅞	98½	106½	93	1,100	5,200	5½ cum. pfd.	100	341,000	5.50	...	33.18	60.59
21	22⅝	18½	29½	15½	34¾	18½	7,300	16,700	Skelly Oil	No	995,349	.75	1.99	2.27	6.07
27¾	29	25	30	22¾	35½	24¾	66,200	189,200	S. O. Indiana	25	15,272,020	1.25	....	1.82	3.16
42¾	46½	40	53½	38	58⅜	39¾	125,100	336,900	S. O. New Jersey	25	26,618,065	1.25	....	2.86	5.64
6	7	5⅝	9⅛	4	8	3⅞	19,300	34,300	Tenn. Corp.	5	853,696	....	.41	.46	1.09
46¾	47⅝	42¾	50¾	32½	49⅝	37⅝	79,300	248,100	Texas Corp.	25	10,876,882	2.00	3.02	2.13	5.02
34¾	35¾	32¾	38½	26	38	26	20,900	64,400	Texas Gulf Sulphur	No	3,840,000	2.00	2.04	1.81	3.03
83	88⅜	78½	94¼	65½	90⅞	57	39,700	140,400	Union Carbide & Carbon	No	9,277,288	1.90	3.86	2.77	4.81
65	65¼	54⅝	69½	52	73½	39	5,300	15,900	United Carbon	No	397,885	3.00	3.81	3.78	5.91
27⅛	28	21	29⅜	13½	30¼	13½	27,700	53,400	U. S. Indus. Alcohol	No	391,238	....	.20	—1.08	1.24
37½	38⅞	28⅜	40	16	28⅞	11½	57,400	120,300	Vanadium Corp. Amer.	No	377,140	1.00	3.25	.61	2.22
28⅜	31½	28½	29¾	18¼	25¼	13½	4,000	14,600	Victor Chem.	5	696,000	1.40	1.59	1.05	1.01
3⅛	4⅛	3	5¾	2½	5⅝	2¾	9,400	21,900	Virginia-Caro. Chem.	No	486,122	....	1.57	—1.80	—.05
27½	31¾	26½	33¾	17	32⅛	15¾	6,900	16,700	6% cum. part. pfd.	100	213,052	....	2.41	1.90	5.88
38¼	38½	33½	39¼	15¼	20⅛	10	6,900	23,100	Westvaco Chlorine	No	339,362	1.85	2.81	1.52	1.46
38	39¼	35⅜	39½	29	31½	20	2,500	10,100	cum. pfd.	30	192,000	1.50	6.64	4.19	4.09
NEW YORK STOCK EXCHANGE															
37⅝	39⅞	31¾	35¾	18⅜	30¼	15½	57,200	222,400	Amer. Cyanamid "B"	10	2,618,387	.60	2.07	.91	2.09
124½	126¾	105	112⅜	76	92	50	2,925	10,575	Celanese, 7% cum. 1st pfd.	100	148,179	7.19	34.17	8.95	22.32
124½	127	105	6⅜	3	6¾	3	900	6,700	Celluloid Corp.	15	194,952	....	....	—2.73	—.92
7	7¾	7	7⅝	4½	12	6½	......	700	Courtauld's Ltd.	£1	24,000,000	.13	4.92%	.26%	8.64%
8⅛	8⅛	6½	9¼	5	9⅞	6	3,800	9,400	Duval Texas Sulphur	No	500,000	....	1.25	.71	.43
90	91	67	68	30	41¼	27	3,475	11,150	Heyden Chem. Corp.	100	125,497	2.00	5.98	2.07	3.94
102¼	104	99	117	90	115½	55	5,000	19,600	Pittsburgh Plate Glass	25	2,192,824	4.00	4.94	3.00	8.53
97	100	89	113½	81	117¾	66	5,400	19,400	Sherwin Williams	25	638,927	2.75	5.96	2.43	8.76
112	114¾	111	116	106½	114⅛	107	340	880	5% cum. pfd.	50	132,189	5.00	35.08	8.76	45.50
PHILADELPHIA STOCK EXCHANGE															
179	179½	166¼	179	135	167	121½	425	1,750	Pennsylvania Salt	50	150,000	6.00	10.52	6.29	11.79

April 1940 Last	April 1940 High	April 1940 Low	1939 High	1939 Low	1938 High	1938 Low	Sales April 1940	Sales 1940	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
104¾	105¼	102	103¾	98	105⅝	99⅛	151,000	613,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
41	41	34	41½	19	38	25⅛	115,000	471,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
105⅝	107¼	105⅛	108⅝	101¾	106⅛	102⅝	1,000	163,000	Dow Chemical	1951	3	J-D	5,000,000
105¼	106	101	102½	90	94	93	140,000	683,000	Industrial Rayon	1948	4½	J-J	7,100,000
38½	39¾	34¼	37	21½	35⅝	24¾	298,000	823,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
21	21	21	30	16	35⅝	24¾	......	5,000	Ruhr Chem.	1948	6	A-O	1,500,000
97	97¾	95	95¾	88¾	...	...	1,357,000	2,814,000	Shell Union Oil	1954	2½	J-J	85,000,000
105¼	106⅜	104⅝	106¼	97⅞	105⅜	100	306,000	941,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104¾	106⅜	103¾	106½	94¼	103	98	474,000	955,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
103¼	108	103¼	108⅝	102	103	95	288,000	976,000	Texas Corp.	1951	3½	J-J	60,000,000
106¾	106¾	104⅝	105⅞	95¼	...	...	360,000	1,180,000	Texas Corp.	1959	3	A-O	40,000,000

* Paid in 1939, including extras but excluding dividends paid in stock. ** For either fiscal or calendar year.

Fats and Oils, 1939

Summary

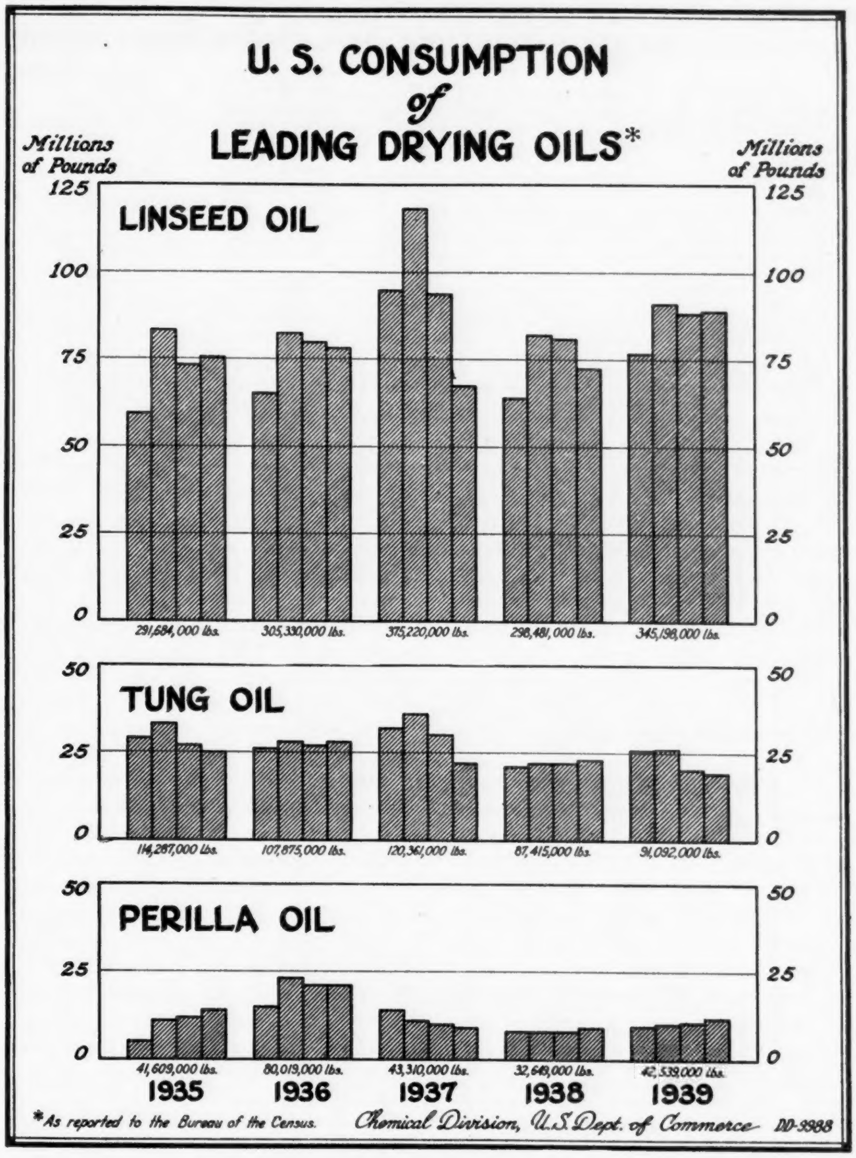
In 1939 the domestic production and consumption of fats and oils were the largest on record: there was a large increase in exports and slightly lower imports, a lower average price range and about the same year-end inventory position as in 1938.

Imports in 1939 of all vegetable, animal, and fish oils and fats (including the oil equivalent of imported oilseeds) amounted to 1,851 million pounds, a 3 per cent. decrease from the 1,900 million pounds imported in 1938 and 19 per cent. less than the previous five-year average of 2,309 million pounds, the latter including the three record years of 1935, 1936, and 1937. The decrease in imports was most pronounced in the vegetable oils used principally for edible purposes, reflecting an increased domestic lard and soybean production.

Exports (including re-exports), amounting to 552 million pounds, were 81 per cent. in excess of the 1938 shipments abroad, lard and soybeans being the principal factors in this increase. There were also substantially larger shipments of vegetable oils to neutral European countries since the advent of war. The total exports were considerably in excess of any previous year since 1934, with practically every product in the fats and oils group sharing in this increase.

Production

An increased production of lard, greases, tallow, soybean oil and linseed oil more than offset the reduced output of cottonseed, peanut and whale oils in 1939, and the total production of fats and oils from domestic materials was the largest on record.



FACTORY CONSUMPTION OF PRIMARY ANIMAL AND VEGETABLE FATS AND OILS, BY CLASSES OF PRODUCTS, CALENDAR YEAR 1939

(Quantities in thousands of pounds)

KIND	TOTAL	Shortening	Oleomargarine	Other Edible Products	Soap	Paint and Varnish	Linoleum and Oilcloth	Printing Inks	Miscellaneous Products	Loss (including oil in foots)
Total	**4,802,989**	**1,406,318**	**241,705**	**426,053**	**1,653,704**	**423,113**	**107,721**	**22,873**	**344,281**	**177,221**
Cottonseed oil	1,321,190	904,950	98,657	233,442	1,061	51	......	192	2,017	80,820
Peanut oil	67,093	51,713	2,445	8,678	805	......	......	......	161	3,291
Coconut oil	529,154	20,659	38,516	43,931	388,912	707	......	3	3,852	32,574
Corn oil	84,067	1,453	489	65,384	4,441	155	......	......	1,586	10,559
Soybean oil	369,760	201,599	70,822	32,345	11,177	21,720	6,438	62	9,332	16,265
Olive oil, edible	3,983	......	......	3,798	54	......	......	......	131	......
Olive oil, inedible	5,514	......	......	......	1,439	14	......	......	4,061	......
Sulfur oil or olive foots	19,370	......	......	......	19,068	......	......	......	302	......
Palm-kernel oil	10,554	266	473	5,292	3,657	......	......	......	36	830
Palm oil	271,046	113,078	1	1,352	102,146	1	......	5	29,681	24,782
Babassu oil	63,193	506	13,944	8,459	37,633	......	......	......	6	2,645
Sesame oil	2,266	724	......	1,102	14	......	......	......	290	136
Rapeseed oil	6,577	37	......	......	2	79	......	......	6,459	......
Linseed oil	344,975	......	......	......	1,780	246,965	68,023	17,526	10,564	117
Tung oil	90,720	......	......	......	......	82,307	3,763	2,105	2,545	......
Perilla oil	42,546	......	......	......	1	28,674	10,758	1,915	1,198	......
Castor oil	41,090	......	......	......	946	11,439	88	317	28,277	23
Other vegetable oils	35,852	887	......	9,181	7,364	5,816	1,264	78	10,709	553
Lard	15,253	7,398	1,355	6,317	50	......	......	2	28	103
Edible animal stearin	32,285	25,574	3,069	3,142	278	......	......	2	160	60
Oleo oil	12,911	470	11,865	147	67	......	......	......	362	......
Tallow, edible	62,246	56,671	69	3,483	418	......	......	1	1,445	159
Tallow, inedible	874,099	......	......	......	785,041	97	1	4	88,795	161
Grease	210,911	......	......	......	120,856	47	1	449	89,038	520
Neat's-foot oil	5,678	......	......	......	11	24	......	4	5,622	17
Marine animal oils	58,650	12	......	......	51,522	36	......	4	7,002	74
Fish oils	222,006	20,321	......	......	114,961	24,981	17,385	204	40,622	3,532

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PRINCIPAL VEGETABLE OILS, PRODUCTION, CONSUMPTION, STOCKS, 1939*

	Production		Consumption		Stocks	
	1939	1938	1939	1938	Dec. 31, 1939	Dec. 31, 1938
Cottonseed, crude	1,390,085,564	1,682,991,109	1,392,438,199	1,706,539,803	181,234,819	175,376,976
Cottonseed, refined	1,313,663,577	1,564,829,316	1,246,818,535	1,435,586,447	553,176,074	563,794,479
Peanut, crude	72,581,000	77,382,286	74,250,975	71,011,375	4,007,837	7,564,228
Peanut, refined	70,990,072	66,698,101	62,873,368	58,150,292	16,222,271	18,793,911
Coconut, crude	273,271,444	286,850,169	586,091,668	578,155,325	178,382,458	202,301,429
Coconut, refined	287,340,162	315,327,136	229,050,139	292,313,831	11,882,610	13,331,925
Corn, crude	150,555,463	134,874,481	150,262,956	144,645,456	20,358,310	14,726,115
Corn, refined	134,657,149	131,099,028	68,146,176	59,639,415	13,479,315	12,308,742
Soybean, crude	449,806,623	322,067,147	390,162,115	275,258,158	43,928,813	49,522,064
Soybean, refined	342,375,425	242,860,377	319,215,442	217,222,545	26,016,891	24,727,916
Palm-Kernel, crude	....	....	8,403,389	50,703,914	374,750	4,050,097
Palm-Kernel, refined	4,623,429	18,284,719	6,769,999	19,539,194	649,950	2,261,489
Rapeseed	....	....	6,517,968	5,326,980	6,600,581	2,889,040
Linseed	564,507,734	440,614,136	345,198,291	298,921,178	142,643,286	141,785,426
China wood or tung	....	....	91,092,102	87,648,700	31,556,115	61,408,141
Perilla	....	....	42,539,104	32,765,537	15,174,694	13,633,268
Castor	75,605,782	52,272,923	41,137,725	28,179,881	12,377,211	17,167,929
Palm, crude	....	....	259,908,010	384,598,597	118,561,747	143,663,788
Sesame	....	....	2,268,359	6,695,772	169,281	205,440
Babassu, crude	71,378,600	49,067,458	67,384,595	52,031,342	5,912,885	1,462,820

*Source Quarterly Statements, Bureau of the Census; all figures in pounds.

A sharp increase of 19 per cent. in the 1939 pig crop over 1938 raised hog production to the pre-drought level, and commercial *lard* production in the United States, in 1939, in establishments canvassed by the Bureau of the Census, reached 1,414 million pounds (including 3 million pounds of neutral lard) an increase of 251 million pounds or 22 per cent., as compared with 1938.

Lard stocks on December 31, 1939, are shown by the Census Bureau at 167 million pounds, a 53 per cent. increase over the 109 million pounds at the end of 1938 and 88 per cent. over the five year 1933-1937 average of 89 million pounds. Exports, totalling 277 million pounds, were 36 per cent. greater than those of 1938, and considerably in excess of the yearly shipments from 1935 to 1937, although only half of the yearly averages of 554 million pounds in the pre-drought five years 1930-1934. The impact of war in Europe has reduced our lard exports below the level that would otherwise have been attained, shipments of this product showing a 46 per cent. increase in the first eight months over the same period in 1938, compared with only 18 per cent. from September to December inclusive.

Increased lard exports are shown to European and Latin American countries in the Trade Agreement group.

The production and consumption of *inedible tallow* and *grease* in 1939 were the largest on record.

Commercial production of *edible tallow* in 1939 was 94 million pounds, compared with 93 million pounds in 1938 and 77 million pounds average in the preceding five years.

Cottonseed production in the 1939-40 crop season is estimated at slightly less than the 5,309,000 tons produced in the previous season. The seed production from the record 1937 cotton crop reached 8,426,000 tons, and in the previous five years averaged 5,221,000 tons. About 80 per cent. of the cottonseed production is usually crushed for oil. Cottonseed stocks at mills on December 31 were 1,162 million tons compared with 1,369 million tons at the previous year end. The production of crude cottonseed oil in the 1939 calendar year, from preliminary figures of the Bureau of the Census, was 1,390 million pounds, a 17 per cent. decrease from the 1,678 million pounds produced in 1938, but 4 per cent. over the previous five-year average of 1,337 million pounds. Stocks of cottonseed oil, both crude and refined, on hand December 31, 1939, amounted to 734 million pounds, compared with 741 million pounds on the same date 1938, and a five-year 1933-1937 average of 662 million pounds.

Including the stocks of crude and refined cottonseed oil on hand December 31, 1939, with the crude oil expected from the cottonseed from the 1939 crop still to be crushed, the potential supplies of cottonseed oil entering the New Year are about one and one-third billion pounds, or approximately the same as for the preceding year.

For the third successive year, *soybean* production has reached new records in the United States. The production of soybeans in 1939 is estimated at 87,409,000 bushels, (60 pounds each) which is 39 per cent. above the 1938 production of 62,729,000 bushels. The 10 year (1928-1937) production was 21,833,000 bushels.

The record 1939 production of crude *soybean oil*, according to preliminary figures of the Bureau of the Census, was 450 million pounds, an increase of 39 per cent. over the 1938 production of 323 million pounds, and 132 per cent. over the 194 million pounds produced in 1937. The 1932-1936 five-year average was 86 million pounds. Food products accounted for about 80 per cent. of the total factory consumption of soybean oil in recent years.

To be continued.

From Fats & Oil Trade of the U. S. in 1939 by Charles E. Lund, Bureau of Foreign & Domestic Commerce.

For comparable statistics for earlier years refer to Statistical & Technical Data Section, July, '39, pages 109-112.

U. S. PRODUCTION LINSEED OIL**

Year	Total Pounds	Jan. 1 to March 31. Pounds	April 1 to June 30. Pounds	July 1 to Sept. 30. Pounds	Oct. 1 to Dec. 31. Pounds
1939	564,507,734	139,209,234	124,822,694	134,326,190	166,149,616
1938	440,614,136	121,587,390	77,513,277	98,407,203	139,106,266
1937	665,098,850	156,877,263	206,511,823	151,278,120	150,431,644
1936	455,959,464	132,136,919	100,118,519	91,805,153	131,898,873
1935	502,043,424	111,822,663	116,946,404	116,666,553	156,607,804
1934	370,768,585	97,451,809	98,025,913	85,037,681	90,253,182

U. S. CONSUMPTION LINSEED OIL*

Year	Total Pounds	Jan. 1 to March 31. Pounds	April 1 to June 30. Pounds	July 1 to Sept. 30. Pounds	Oct. 1 to Dec. 31. Pounds
1939	345,198,291	76,673,550	91,359,976	88,396,756	88,768,009
1938	298,921,178	63,874,555	81,891,716	80,735,553	72,419,354
1937	374,468,851	94,980,998	118,260,108	93,816,524	67,411,221
1936	305,329,679	65,128,254	82,397,832	79,701,761	78,101,802
1935	291,683,903	59,406,538	83,082,616	73,809,240	75,385,509
1934	258,483,721	63,519,296	78,167,202	61,677,514	55,119,709

* Bureau of the Census, Dept. of Commerce.
** Represents oil recovered from both imported and domestically produced flaxseed.

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A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Manufacture stock feed from blackstrap molasses and corn oil cake meal. No. 2,197,319. Earl O. Sargent.

Cellulose

Process purifying cellulose material. No. 2,195,396. Nils W. Coster to Soundview Pulp Company.

Cellulose ether containing 2-2.75% etherifying groups per anhydroglucose unit, plasticized with polychlorodiaryl oxide, to improve flexibility, reduce moisture permeability, and increase dielectric strength. No. 2,196,-575. Shailer L. Bass & Earl G. Hallonquist to The Dow Chemical Co.

Plasticized cellulose derivative compositions. No. 2,196,746-751. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Plasticized cellulose derivative compositions. No. 2,196,749. Joseph B. Dickey to Eastman Kodak Co.

Process for coloration of cellulose ester or ether materials. No. 2,196,-984. George H. Ellis, Chas. F. Topham, and Henry C. Olpin to Celanese Corp. of America.

Chemical Specialty

Thermally responsive liquid solution comprising water, ester of an acid having dissociation constant not less than 1.8 x 10-5 at 25° C., buffer salt and indicator which changes color with change of pH. No. 2,195,395. Arthur William Chapman.

Process forming bar of milled toilet soap having floating properties. No. 2,195,399. Thomas S. Eagen to The Procter & Gamble Company.

Composition containing photographic fixing agent. compound of sulfamic acid group, substances which readily yield sulfamic acids by hydrolysis. No. 2,195,405. Merlin M. Brubaker to Du Pont Film Manufacturing Corp.

Wood preservative oil. No. 2,195,413. Jacquelin E. Harvey, Jr.

Method producing wetting, washing, dispersing and penetrating agents from aliphatic alcohols containing not less than eleven carbon atoms. No. 2,195,418. Ernst A. Maversberger to American Hyalsol Corporation.

Aqueous photographic bleach bath comprising oxidizing agent and compound taken from group consisting of sulfamic acids and their easily hydrolyzable salts. No. 2,195,419. David M. McQueen and Max T. Goebel to Du Pont Film Manufacturing Corp.

In porcelain molding process, steps comprising making pattern, coating pattern with material which will not combine with fused porcelain and which will give a smooth hard finish. No. 2,195,452. Reiner W. Erdle to Dental Research Corporation.

Process for the treatment of liquid or semisolid foods and foodstuffs. No. 2,195,469. Karl Richter to Metra Maatschappij voor Verduurzaming van Zuivelproducten N. V.

Lubricant containing di-iso-butyl phenol. No. 2,195,510. Troy L. Cantrell to Gulf Oil Corporation.

Detergent and method of making same. No. 2,195,512. Emil E. Dreger and John Ross to Colgate-Palmolive-Peet Co.

Stable, bituminous emulsion. No. 2,195,529. William H. Carmody to The Neville Company.

Blending agent for lubricating oils. No. 2.195,549. Jones I. Wasson to Standard Oil Development Company.

Laying of dust comprising contacting it with aqueous solution of a condensation product of an alkylalamine and a higher organic acid substance. No. 2,195,573. Wolf Kritchevsky to Ninol, Inc.

Sound absorbing composition. No. 2,195,580. Kenneth S. Rankin.

Process producing alkyl hydroxy sulfonate detergents. No. 2,195,581. John Ross to Colgate-Palmolive-Peet Co.

Completely neutral silicate cement comprises the reaction products of 9.4 parts solid sodium silicofluoride and 70 parts liquid 38% sodium silicate and a suitable amount of aggregate. No. 2,195,586. Foster D. Snell.

Stable vitamin-containing therapeutic preparation. No. 2,195,595. Ferdinand W. Nitardy to E. R. Squibb & Sons.

Protected vitamin-containing tablet. No. 2,195,596. Ferdinand W. Nitardy to E. R. Squibb & Sons.

Process treating alcoholic beverage in barrel having a bung-hole, includes directing concentrated pencil of selected rays into interior of barrel. No. 2,195,662. Robert Hays Van Sant to American Chlorophyll Co.

Lubricant comprising a lubricant and blue lead. Blue lead making up 10-20% by weight of the whole. No. 2,195,669. Geo. S. Cavanaugh to The Penzoil Co.

Insecticidal composition. No. 2,195,696. Clarence D. Dolman to Hercules Glue Co.

Brushless shaving cream comprising plastic emulsion of oleaginous material and water and having included a compound having oleophillic, and hydrophillic groups in the molecule. No. 2,195,713. Wolf Kritchevsky to Rit Products Corp.

Composition and process for making leather. No. 2,195,715. John V. Vaughen to E. I. du Pont de Nemours & Co.

Cleaning composition and method of cleaning internal combustion engines. No. 2,195,843. William J. Sweeney and Joshua A. Tilton to Standard-I.G. Company.

Process for making refractory bodies and material. No. 2,195,949-950. Arthur R. Wood to Pilkington Bros., Ltd.

Fingernail enamel comprising cellulose nitrate, plasticizer and polymerized organic derivative of an acrylic acid selected from group consisting of aliphatic and alicyclic esters of an acrylic acid. No. 2,195,971. Richard C. Peter to E. I. du Pont de Nemours & Co.

Fire extinguishing foam stabilizing agent comprising an amino soap capable of being dissolved or dispersed in water, and a glycol. No. 2,196,042. Lewis G. Morris to Pyrene Minimax Corp.

Refractory and method of making it. No. 2,196,075. Ian M. Logan and John Charles McMullen to The Carborundum Company.

Method of preparing luminescent material. No. 2,196,082. Willard A. Roberts to General Electric Co.

Grinding wheel comprising abrasive grain and a bond including

$$[(C_5H_5)_2O]_n$$

No. 2,196,090. Lorenzo Stone Washburn to Norton Co.

Improved mineral lubricant oil compositions comprising major proportion of viscous mineral lubricating oil fraction and minor proportion of nitrated fatty oil. No. 2,196,101. Emmett C. Carmichael, Richard J. De Gray and John H. Prall to Socony-Vacuum Oil Co.

Paint removing composition. No. 2,196,111. John V. Freeman.

Edible gelatin composition containing buffer salt which speeds up setting by repressing ionization of the fruit acid without deleteriously affecting palatability. No. 2,196,146. Wm. R. Collins to Standard Brands, Inc.

Dentifrice in form of small granules containing polishing agent, binder, detergent and other conventional dentifrice ingredients. No. 2,196,150. Robert F. Heald and Robert J. Mehaffey to Colgate-Palmolive-Peet Co.

Dentifrice in form of small, discrete hollow bodies or beads of spherical shape. No. 2,196,154. Albert Lyle Schulerud to Colgate-Palmolive-Peet Co.

Aqueous emulsion suitable for protectively coating fresh fruits. No. 2,196,164. Miles L. Trowbridge and Charles D. Cothran to Brogdex Company.

Process preventing coagulation of blood or plasma in a container by coating walls of container with substance from rare earth metals group. No. 2,196,199. Hanns Dyckerhoff.

Method of developing for color photography. No. 2,196,226. Humphrey D. Murray and Douglas A. Spencer to The Veracol Film Syndicate, Ltd.

Method treating cleaned intestines comprises producing a shrinkage by subjecting to action of organic acid solution containing KHC_4 H_4O_6 and C_4 H_6 O_6, simultaneously subjecting action of Na NO_3 and My SO_4 and subsequently restoring to original size and washing therefrom the above mentioned salts. No. 2,196,238. Albert B. Werby to Fuerchtegott Willy Jaeger.

Method of molding ceramic articles. No. 2,196,258. Reiner W. Erdle to Dental Research Corp.

Method obtaining improved gelatin by addition of certain hydrates and salts. No. 2,196,300. Donald P. Grettie.

An inhalent comprising oil-soluble medicinal agent and lung-absorbable vehicle of group consisting of lower-alky esters of higher fatty acids and aliphatic polyhydroxy compounds incompletely esterified with higher fatty acids. No. 2,196,322. Ferdinand W. Nitardy and Walter G. Christiansen to E. R. Squibb & Sons.

Method of promoting the propagation and the activity of microorganisms. No. 2,198,361. Paul Liebesny and Hugo Wertheim.

Stable, aqueous emulsion dilutible with water. No. 2,196,367. William J. Thackston to Rohm & Haas Co.

Insecticidal composition comprising cryolite, a copper silicate complex and a petroleum sulfonate. No. 2.196,448. William Hunter Volck to California Spray-Chemical Corp.

Pharmaceutical preparation, containing any isopropanalamine salt of theophylline, having definite M. P. and crystal structure. No. 2.196,495. Frederick R. Greenbaum to The Nation Drug Co.

Wetting agent for alkaline mercerizing solutions. No. 2,196,562. Heinrich Lier to Chemical Works.

Composition of matter containing neoprene dissolved in dialkyl ketone containing at least four carbon atoms. No. 2,196,602. Arthur W. Browne to The B. F. Goodrich Co.

Process for manufacturing viscous products suitable for lubrication. No. 2,196,670. Egon Eichwald to Shell Development Co.

Method forming colored photographic image comprises developing exposed silver halide image in alkaline solution of 1:2 or 1:4 dihydroxynaphthalene and an organic derivative of hydrazine. No. 2,196,734. Anthony Marriage to Eastman Kodak Co.

Photographic developer for color photography. No. 2,196,739. Willard D. Peterson to Eastman Kodak Co.

A liquid antiseptic soap. No. 2,196,763. Louis J. Figg, Jr.. to Eastman Kodak Co.

Manufacture a medicament surrounded by an enteric film or layer of cellulose derivative which is substantially insoluble in acid stomach secretions and soluble in alkaline intestinal fluids. No. 2,196,768. Gordon D. Hiatt to Eastman Kodak Co.

Method making nonbleeding photoprints. No. 2,196,788. Harold J. Brunk and Morris Dickason to The C. F. Pease Company.

Process for improving drying properties of oils. No. 2,196,796. Anthony A. Holler.

Flux composition consisting of boric acid, an alkali acid fluoride and an alkali borate. No. 2,196,853. Lionel Cinamon and Samuel Sklarew to Special Chemicals Corp.

Process of purifying absorbent menstruums. No. 2,196,878. William A. Stover to Petroleum Engineering, Inc.

A multi-component photographic developer composition comprising core containing the component which is last to be dissolved surrounded by at least one layer containing components requiring solution before the component of the core. No. 2,196,901. Garnet Philip Ham to American Cyanamid Co.

Bonding compound. bonded products and methods of making same. No. 2,196,971-974. Willis A. Boughton and Wm. R. Mansfield to New England Mica Company.

Roughly comminuted composition comprising 1 part solid phenol, 1.1-2.0 parts bentonite. No. 2,196,988. Sheldon B. Heath and Wayne L. Scoles to The Dow Chemical Co.

Aqueous liquid polishing composition comprising finely divided tin oxide, sodium silicate, and sodium salt of lauryl alcohol sulfate. No. 2,196,992. Edwin W. Keller.

Photographic developer containing reaction product of morpholine with SO_2. No. 2,197,016. Wm. H. Wood to Harris-Seybold-Potter Co.

Photographic developer containing silver halide developing agent, sulfite of morpholine and an inorganic salt of hydroxyaliphatic amine. No. 2,197,017. Wm. H. Wood to Harris-Seybold-Potter Co.

Process manufacturing concentrated sweetened milk containing added vitamins. No. 2,197,095. Bernard Cuenod to Societe d'etudes et applications industrielles.

Method drying prints of printing ink containing solvents which are substantially non-volatile at 20° C. but which evaporate rapidly at 150° C. comprises passing prints through bath of inert hot fluid. No. 2,197.145. Loy S. Engle to Interchemical Corp.

Lubricating oil containing aryl fatty acid soap. No. 2,197,153. David R. Merrill to Union Oil Co. of California.

Manufacture of adhesives, such as wood glue. No. 2,197,168. Eugen Abramowitsch.

A chewing gum base containing an olefin-diolefine resin. No. 2,197,240. George A. Hatherell to Frank A. Garbutt.

Insecticides containing as active ingredients (1) 9-fluorenol, (2) 9-fluorenone, (3) 2-amino fluorene. No. 2,197,249. Houston V. Claborn and Lloyd E. Smith to Henry A. Wallace, Secretary of Agriculture.

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Improved lime base grease composition. No. 2,197,263. Emmett S. Carmichael and George M. Hain to Socony-Vacuum Oil Co., Inc.

Method stabilizing oleaginous materials by use of reaction products of castor oil and an aliphatic acid having at least two reactive groups. No. 2,197.269. Arthur Guillaudeu to Industrial Patents Corp.

Color forming developer comprising an aromatic amine developing agent and a coupler consisting of a diaryl methone. No. 2,197,311. Philibert Leopold Jozef Raymond Merckx and William Karel Antoon Korber to Gevaert Photo-Producten N. V.

Method bonding fibrous material to an aluminum foil. No. 2,197,405. Junius D. Edwards to Aluminum Co. of America.

Stable oxygen resistant, non-bleaching lubricant grease having low absorbability in rubber. No. 2,197,433. William A. Lutz to Gulf Research & Development Co.

In manufacturing margarine, step of chilling admixture of the constituting components of margarine which has been supercooled, congealed, and worked to lower the temperature, to obtain a margarine free from lumps. No. 2,197,457. Emile E. Werk and Harry M. Zeking to The Chrungold Corp.

Dry insecticidal composition, readily dispersible in water to form stable dispersion. No. 2,197,500. George L. Hockenyos to Monsanto Chemical Co.

Abrasive product comprising abrasive granules bonded with cured organic primary bond from group consisting of shellac, rubber and synthetic resin and fused secondary bond from group coisisting of selenium, tellurium and sulfide compounds thereof. No. 2,197,552. Joseph N. Kuzmick to Raybestos-Manhattan, Inc.

Fire-resisting, insulating wall plaster. No. 2,197,566. Paul S. Denning to F. E. Schundler & Co., Inc.

For use in manufacture of flexible abrading element, an isomeric composition of a rubber derivative as a securing means for the grit particles. No. 2,197,629. Howard G. Bartling to Minnesota Mining and Manufacturing Co.

Fingernail cleaning composition. No. 2,197,630. Horace M. Carter.

Process forming abrasive article in which abrasive is bonded by metal alloy. No. 2,197,655. John A. Boyer to The Carborundum Co.

Production catalyst compact for use in production of H_2 and CO_2 from CO and H_2O vapor, the step of compressing mixture of flake graphite with iron oxide containing catalytic material under pressure to form coherent compacts. No. 2,197.707. Eugene D. Crittenden to The Solvay Process Co.

Chewing gum including lanolin and jelutong. No. 2.197,718. Herbert W. Conner to Wm. Wrigley, Jr., Co.

Chewing gum including chicle and phosphatide. No. 2,197,719. Herbert W. Conner to Wm. Wrigley. Jr., Co.

Coal Tar Chemicals

Preparation compounds of anthraquinone comprising reacting amino compound of an anthraquinone with a phosphorous halide and treating resulting compounds with alkaline agents. No. 2,195,462. Artur Krause and Walter Mieg to General Aniline & Film Corp.

Anthrone of general formula

$$\begin{array}{c} OH \\ A\text{-}NH\text{-}P{=}O \\ OH \end{array}$$

where A is anthrone radical containing in the 1.9-position a six membered ring. No. 2,195,463. Artur Krause, Walter Kuehne and Walter Mieg to General Aniline & Film Corporation.

Method charging and discharging battery of coke ovens. No. 2,195,466. Carl Otto to Otto Wilputte Ovenbouw Mij. N. V.

Manufacture light-colored asphalt. No. 2,195,536. Kenneth C. Laughlin and Harry E. Cier to Standard Oil Development Company.

Process for separating asphalt oils containing same. No. 2,196,989. Robert W. Henry and James V. Montgomery to Phillips Petroleum Company.

A road and roofing asphalt capable of being heated to 500° F. without substantial decomposition comprising an asphalt containing not more than 20% by weight of polyisobutylene having a molecular weight above 800. No. 2.197,461. Alvin Pierce Anderson and William Kenneth Nelson to Shell Development Co.

Coatings

Method coating an article comprises applying film of solvent and rubber which has a plasticity of 72-75 by Goodrich simplified plastometer, evaporating the solvent, and vulcanizing the film. No. 2,196,060. Orby B. Crowell and Frederick A. McGregor to General Electric Co.

Composition for coating and impregnating comprising hardenable organic colloid, hardening agent and preponderance by weight of colloidal graphite in aqueous medium. No. 2,196,128. Albert H. Stuart to Acheson Colloids Corp.

Coating composition comprising polymeric derivative of vinylidene chloride and non-thermoplastic fibrous material, provides permanent adhesion between vinylidene chloride polymer and a clean metal surface. No. 2,196,579. Robert C. Reinhardt to The Dow Chemical Co.

Coating composition including solvent and synthetic resinous material. No 2,197,047. Irvin W. Humphrey and Joseph N. Borglin to Hercules Powder Co.

Process for producing permanent coherent coating of aluminum on a glass surface. No. 2,197,274. Edward W. Menke to Kelmenite Corp.

Method producing non-metallic protective coating on magnesium. No. 2,197,611. Johannes Fischer and Werner Richter to Siemens & Halske Aktiengesellschaft.

Dyes, Stains, etc.

After-chromable acid dyestuffs of the triphenylmethane series. No. 2,195.440. Paul Wolff and Hans Moehrke to General Aniline & Film Corp.

Disazo dyes. No. 2,195,443. Walther Benade to General Aniline & Film Corp.

Metal compounds of the sulfonated azo dyestuffs containing at least one azo group. Said dyestuffs are yellow to brown and black powders dissolving in water to yellow to orange and to brown solutions. No. 2,195,784. Max Schmid to Society of Chemical Industry in Basel.

Sulfonated azo dyestuffs. No. 2,195,786. Max Schmid to Society of Chemical Industry in Basle.

Complex metal compounds of sulfonated azo dyestuffs. Nos. 2,195,787-788. Max Schmid to Society of Chemical Industry in Basle.

Azo dyestuffs insoluble in water and fiber dyed therewith. No. 2,196.015. Hans Heyna, Willy Schumacher and Otto Scherer to General Aniline & Film Corp.

Azo dyestuffs dyeing cellulosic fibers reddish to deep blackish-brown shades of good neutral and alkaline dischargeability. No. 2,196,028. Hans Roos to General Aniline & Film Corp.

Polymethine dyestuffs of general formula R-CH=CH-CH=R, where R is a quinoxaline radical and R′, a radical of group consisting of quinoxaline radicals and 1.3.3 - trialkylindoline radicals. No. 2,196,162. Werner Muller, Ottmar Wahl, Ernst Teupel to General Aniline & Film Corp.

Process coloring organic derivative of cellulose with azo dye. Nos. 2,196,221-222. Jas. G. McHally and Joseph B. Dickey to Eastman Kodak Co.

Azo compound and process for coloring therewith. No. 2,196,745. Joseph B. Dickey and John R. Byers, Jr., to Eastman Kodak Co.

Azo compounds and process for coloring therewith. No. 2,196,757. Joseph B. Dickey to Eastman Kodak Co.

Azo dye compound having general formula R-N=N-P, where R is from group consisting of an aryl nucleus of benzine series, aryl nucleus of naphthalene series and a benzothiozole nucleus and P is phenanthroline compound. No. 2,196,776. James G. McNally and Joseph B. Dickey to Eastman Kodak Co.

Readily soluble basic coloring matter. No. 2,196,885. Max Wyler to Imperial Chemical Industries, Ltd.

Vat dyestuffs. Nos. 2,197,044-045. Ernst Honold, Heinrich Neresheimer, Max Schubert, Berthold Stein and Karl Saftien to General Aniline & Film Corp.

Copper complex compounds of polyazo dyestuffs. No. 2,197,350. Hans Schindhelm, Fechenheim and Carl Theo Schultis to General Aniline & Film Corp.

Production metal-phthalocyanine coloring matter. No. 2,197,458. Max Wyler to Imperial Chemical Industries, Ltd.

Production metal-phthalocyanine coloring matter containing tin. No. 2,197,459. Max Wyler to Imperial Chemical Industries, Ltd.

Equipment and Apparatus

Apparatus for vaporizing liquids. No. 2,195,560. Solon Alexander Daveron.

Water softening device. No. 2.195,616. Andrew J. Chesson.

Apparatus for coating selected portions of articles. Nos. 2,195,670-671. Enoch T. Ferngren to Plax Corp.

Method of manufacturing selenium rectifiers. No. 2,195,725. Georg Hoppe to Patentverwertungs-Gesellschaft mit beschrankter Haftung "Hermes."

A catalytic converter for oxidation of SO_2 to SO_3. No. 2.195,738. Earl S. Ridler and Arthur S. Weygandt to E. I. du Pont de Nemours & Company.

Dust indicating apparatus. No. 2,195,842. William M. Schweickart to Pocahontas Fuel Co.

Fractional condenser. No. 2,195,887. Meinhard H. Kotzebue.

Apparatus for purifying water with ozone. No. 2,195.981. Alan B. Conant to Montgomery Bros.

Separating apparatus for removing solids from liquids. No. 2,196,119. James Macdonald Mitchell.

Means for sterilizing liquids and filling containers. No. 2,196,299. Henry F. Glunz

Apparatus for distilling wood. No. 2,196,343. Daniel J. Saltsman, 1/3 to G. W. Laubenthal, 1/3 to W. B. Crane.

Method of and apparatus for separating, washing, and grading lump materials. No. 2,196,451. Hiram A. Holzer to United Iron Works Co.

Apparatus for the recovery of heat and chemicals from black liquor. No. 2,196,496. Alexander Leopold Hamm to Combustion Engineering Company.

Raw stock dyeing apparatus. No. 2,196.558. Stonewall W. Jackson to Morton Machine Works.

Combined raw stock and package dyeing apparatus. No. 2,196,559. Stonewall W. Jackson to Morton Machine Works.

Apparatus for treating textile fibers. No. 2,196,621. Harold T. Battin and Walter F. Silva to United States Rubber Co.

Apparatus for aerating liquids. No. 2,196,632. Henry Hamilton Hover and Peggy Wilson to Dorset Industries. Ltd.

Apparatus for pulverizing materials. No. 2,196,642. Clarence S. Ramsey.

Filtering unit comprising tube consisting of spirally wound length of filtering material impregnated with polymerized resin. No. 2,196,821. George A. Arnold to Motor Improvement, Inc.

Means for and method of filtering milk. No. 2,196,848. Henry B. Babson and Chester A. Thomas to Babson Bros.

Apparatus for treatment of water to remove turbidity. No. 2,196,908. Frank Bachmann to The Dorr Company, Inc.

Delivery apparatus of the piston and cylinder type for liquid and semi-liquid substances. No. 2,195,959. Paul Faulkner Crothers to Trier Bros., Ltd.

A bubble tower. No. 2,197,199. William M. Welch.

Process of and machine for separating solids from suspension in a liquid. No. 2,197,509. Frank C. Reilly and Charles D. Morton.

Apparatus for degassing an organic liquid. No. 2,197,539. Kenneth C. D. Hickmann to Distillation Products, Inc.

Filter installation and filtering procedure. No. 2,197,610. John H. Fedeler, Jr., to Thos. C. Stephens.

Chemical pump. No. 2.197,730. Harold James Mugford to The Wicaco Machine Corporation.

Explosives

An explosive, demethylal-nitro-methyl-methane dinitrate. No. 2,195,551. Joseph A. Wyler to Trojan Powder Company.

Fine Chemicals

Di-alkyl diphenol sulfide. No. 2,195,539. Louis A. Mikeska and Charles A. Cohen to Standard Oil Development Co.

Amino-phenylhydrazinesulfonic acids and process of preparing same. No. 2,195,785. Max Schmid to Society of Chemical Industry in Basle.

An aminohydrazine-disulfonic acid. No. 2,189,789. Max Schmid to Society of Chemical Industry in Basle.

Acylated hydrazines and process of preparing same. No. 2,195,790. Max Schmid to Society of Chemical Industry in Basle.

3-carboxy(S-diphenyl-thiocarbamido)-4′-stibonic acid. No. 2,195.885. George Malcolm Dyson and Arnold Renshaw to Parke, Davis & Company.

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Preparation furonitrile comprising bringing vaporized member of group consisting of furoic acid, its anhydride, ammonium salt, and amide in admixture with NH_3, into contact with solid dehydration catalyst at temperature 275°-375° C. No. 2,195,966. Benj. W. Howk and Chas. G. Wortz to E. I. du Pont de Nemours & Co.

Process of producing new amino-carboxylic acids. No. 2,195,974. Walter Reppe and Hanns Uffer to I. G. Farbenindustrie Aktiengesellschaft.

Halogenated phthalocyanines. No. 2,195,984. Charles E. Dent and Wm. A. Silvester to Imperial Chemical Industries, Ltd.

Recovery of krypton and xenon from the atmosphere. No. 2,195,987. Eugene Gomonet to Air Reduction Co.

Water-soluble basic aluminum compounds. No. 2,196,016. Werner Huehn and Walfried Haufe to I. G. Farbenindustrie Aktiengesellschaft.

Method making sodium aluminum fluoride from fluorspar. No. 2,196,077. John E. Morrow and James R. Wall to Aluminum Company of America.

Preparation 3,20-dihydroxy compound of pregnane series comprises heating a 3,20-dihydroxy compound of pregnane series in presence of alkali metal. No. 2,196,220. Russell Earl Marker to Parke, Davis & Company.

Process obtaining estrogenic substances from body-fluid sources thereof of group consisting of fetal fluid and urine. No. 2,196,295. Carl W. Eberlein to E. R. Squibb & Sons.

Magnesium titanates and methods of making same. No. 2,196,325. John A. Plunkett and Eugene Wainer to The Titanium Alloy Manufacturing Co.

Method for the production of isobutylene. No. 2,196.363. Anthony E. Robertson to Standard Development Co.

Phenylmercuric borate, M.P. 112-113° C. and obtainable by vacuum evaporation alcoholic solution equimolar proportions phenylmercuric hydroxide and boric acid. No. 2,196,384. Walter G. Christiansen to Lever Bros.

Nitrogen-containing organic compounds and process for their preparation. No. 2,196,447. Adrianus Johannes van Peski to Shell Development Company.

Production of condensation products of vinyl methyl ketone and water-soluble aldehydes. No. 2,196.452. Heinrich Hopff to I. G. Farbenindustrie Aktiengesellschaft.

Continuous process for manufacture mono-hydroxy-alkylamines. No. 2,196,554. Henri Martin Guinot to Les Usines de Melle.

A glycol ether. No. 2,196,576. Gerald H. Coleman and Garnett V. Moore to The Dow Chemical Co.

Production of useful chemicals from isomeric mono-nitro-ortho-dichlorobenzene mixtures. No. 2,196,580. Frank B. Smith and John N. Hansen to The Dow Chemical Co.

In manufacture alkali metal salt of aliphatic carboxylic acid, step of contacting certain alcohol with finely divided alkali metal hydroxide and heating to 250-320° C. No. 2,196,581. Wilbur T. Stephenson and Earl L. Pelton to The Dow Chemical Co.

Manufacture of ferric sulfate. No. 2,194,584. Austin G. Edison to E. I. du Pont de Nemours & Co.

Process for the preparation of organic disulfides. No. 2,196,607. Roger A. Mathes to The B. F. Goodrich Co.

Process of recovering carbon disulfide in the manufacture of artificial silk. No. 2,196,843. Hendrikus van Deinse to Naamlooze Vennootschap Kunstzijdespinnerij.

Preparation of compounds of fluorine. No. 2,196.907. Carl F. Swinehart to The Harshaw Chemical Co.

Light-sensitive layer comprising besides an amino diazo compound a 2.3 dioxynaphthalene as coupling component. No. 2,196,950. Rudolf Zahn, Robert Franke to Kalle & Co.

Production d-tartaric acid, comprises oxidizing member from group consisting of 5-keto-d-gluconic acid and its salts by action of oxygen containing gas at pH between 0.1-14. No. 2,197,021. Richard Pasternack and Ellis V. Brown to Chas. Pfizer & Company.

Preparation ethers comprises reacting aliphatic alcohol with tertiary olefine at temperature below 100° C. in presence of normally gaseous and liquid halide of inorganic metal of groups III and IV of periodic system. No. 2,197,023. Helmuth G. Schneider to Standard Oil Development Co.

Maleic anhydride-rosin ester products and method of producing. No. 2,197,046. Irvin W. Humphrey and Joseph N. Borglin to Hercules Powder Co.

Reaction product of an alcohol with the reaction product of an ester of a monohydric heterocyclic alcohol and an unsaturated rosin acid with maleic anhydride, the unsaturation of said alcohol being reduced by hydrogen. No. 2,197,048. Irvin W. Humphrey and Joseph N. Borglin to Hercules Powder Co.

Reaction product of an ester of an unsaturated furfuryl alcohol and a hydrogenated rosin acid with maleic anhydride. No. 2,197,049. Irvin W. Humphrey and Joseph N. Borglin to Hercules Powder Co.

Monoethers of alicyclic glycols. No. 2,197.105. Harold S. Holt to E. I. du Pont de Nemours & Co.

An isobutenyl diethyl malonate. No. 2,197,362. Herbert P. A. Groll and Clarence J. Otto to Shell Development Co.

Light sensitive layer comprising coupling component and a diazo sulfonate which carries in the nucleus containing the diazo sulfonate group at least two etherified oxy groups and no amino group. No. 2,197,456. Gottlieb von Poser Maximilian P. Schmidt and Georg Werner to Kalle & Co. Aktiengesellschaft.

Process obtaining heteropolar compound from an unsaturated ketone. No. 2,197,462. Franklin A. Bent to Shell Development Co.

Secondary ethers of polyhydric alcohols. No. 2,197,467. Theodore W. Evans and Edwin F. Bullard to Shell Development Co.

Carbamic acid esters of monoalkyl ethers of polyalkylene glycols. No. 2,197,479. Frederick M. Meigs to E. I. du Pont de Nemours & Co.

Method stabilizing solution of heavy metal betadiketonate compound in a liquid hydrocarbon, associated with water. No. 2,197,498. Walter S. Guthmann to Leo Corp.

Method of producing reaction products of ammonia and aldose sugars. No. 2.197,540. Eugene D. Klug to Hercules Powder Co.

Method purifying a di-ester of phthalic acid which has vapor pressure sufficiently low that it can be used as condensation pump fluid. No. 2.197,546. James G. Baxter and Robert L. Edward to Distillation Products, Inc.

Acyl styrene in which aliphatic hydrocarbon radical of acyl group contains at least 11 C atoms. No. 2,197,709. Anderson W. Ralston and Robert J. Vander Wal to Armour and Company.

Industrial Chemicals

Butyl-acetone fermentation process and inoculant. No. 2,195,629. John Muller to Commercial Solvents Corp.

Process halogenating unsaturated carboxylic acid esters at temperature of about 0° C. No. 2,195,712. Ralph A. Jacobson to E. I. du Pont de Nemours & Co.

Method for sugar clarification. No. 2,195,739. William Airth Rolston.

Production of liquid polymerization products from olefins. No. 2,195,747. Emil Keunecke and Wilhelm Muench to I. G. Farbenindustrie Aktiengesellschaft.

Production of granular, substantially dustless calcium hypochlorite product. Nos. 2,195,755-756-757. 755 Homer L. Robson and Gregory A. Petroe. 756 Maurice C. Taylor. 757 Homer L. Robson, all to The Mathieson Alkali Works, Inc., and Gregory A. Petore.

Process for the removal and recovery of free sulfur. No. 2,195.870. Raphael Rosen to Standard Oil Development Co.

In manufacture Na OH from Na Cl steps comprising reacting Ba Oh and Na Cl in presence of H_2O at temperature not over 40° C., concentrating resulting product by evaporation and separating solids. No. 2,195,917. Ivor Laurance Clifford to Imperial Chemical Industries, Ltd.

Method of separating constituents of gaseous mixtures. No. 2,195,976. Joseph L. Schlitt to Air Reduction Co.

Process recovering CO_2 from gases comprises absorbing gases in aqueous medium with borax and subsequent separation. No. 2,195,980. Raymond F. Bacon and Rocco Fanelli; said Faneilli assignor to Bacon.

Process recovering SO_2 from gases involving use of an absorption liquid containing compound capable of reacting with SO_2 to form sulfurous acid, then liberating the SO_2. No. 2,196,004. Raymond F. Bacon and Rocco Fanelli, said Fanelli assignor to Bacon.

Process for production beryllium oxide from minerals containing beryllium and for cyclic recovery of the reacting agent employed. No. 2,196,048. Carlo Adamoli to Perosa Corp.

Denatured alcohol consisting of ethyl alcohol and .1-5% by volume of organic denaturant. No. 2,196.152. Hamline M. Kvalnes to E. I. du Pont de Nemours & Co.

Process for regenerating fused saltpeter baths. No. 2,196,153. Josef M. Michel to I. G. Farbenindustrie Aktiengesellschaft.

Production of formic acid from formamide. No. 2,196,156. Walter Speer and Hans Weiss to I. G. Farbenindustrie Aktiengesellschaft.

Process making alcohols from olefins, consists in absorbing olefins in H_2SO_4, and passing the formed ester acid liquor into hydrolyzing zone in contact with supply of water No. 2,196,177. Robert E. Burk and Herman P. Lankelma to Standard Oil Co. of Ohio, Corp. of Ohio.

Production formaldehyde by causing equimolecular quantities of CH_4 and O_2 to pass through porous unglazed porcelain at 1-20 atm. pres. and 400-600° C. No. 2,196,188. William Arthur Bone and Dudley M. Newitt to Imperial Chemical Industries, Ltd.

Improved method for accelerating artificial aging of raw fermented and distilled alcoholic beverages by subjecting to direct action of mechanically produced compressed waves of supersonic frequency. No. 2,196,193. Leslie A. Chambers and Edward W. Smith to Submarine Signal Co.

Process for manufacturing C.P. hydrochloric acid. No. 2,196,246. James W. Brown and Donald P. Hill to E. I. du Pont de Nemours & Co.

Process removing weakly acidic gas from gaseous mixture. No. 2,196,281. Vanderveer Voorhees to Standard Oil Company.

Improvement in production synthetic tans by condensing phenol monosulfonic and naphthalene monosulfonic acid. No. 2,196,344. Josef Schafer and Robert Biedermann to J. R. Geigy.

Preparation carboxylic acids comprises oxidizing, with HNO_3 member of class consisting of cyclic aliphatic primary amines and nitrates and nitrites thereof. No. 2,196,357. Ellsworth K. Ellingboe and James E. Kirby to E. I. du Pont de Nemours & Co.

Recovery fatty acids from hydrocarbon distillate. No. 2,196,421. Thomas F. McCormick and Arthur Lazar to Tide Water Associated Oil Company.

Method removing water from hydroxides by use of anhydrous, liquid NH_3. Nos. 2,196,593-594. Irving E. Muskat to Pittsburgh Plate Glass Company.

Process purifying hydrated impure hydroxides of alkali metals by use of water soluble organic amine. No. 2,196,596. Irving E. Muskat to Pittsburgh Plate Glass Company.

Denatured alcohol containing 1:4-dioxan. No. 2,196,760. Louis J. Figg, Jr., to Eastman Kodak Co.

Denatured alcohol containing an alkylene dichloride. No. 2.196,761. Louis J. Figg, Jr., to Eastman Kodak Co.

Denatured alcohol containing a chloroethylene. No. 2,196,762. Louis J. Figg, Jr., to Eastman Kodak Co.

Continuous process treating limestone having Mg and Ca components and recovering Ca CO_3. No. 2,196,949. William J. Young to The Standard Lime & Stone Company.

A mixture of sulfonated alkyl-hydroxy aromatic compounds. No. 2,196,985. Lawrence H. Flett to National Aniline & Chemical Co., Inc.

Process distilling pyroligneous acid liquor and removing distillate, subjecting to distillation and recovering methanol. No. 2,197,169. Jesse M. Coahran.

Method treating α-methyl styrene comprises subjection to gas containing O_2 in presence of oxidizing catalyst at 60-160° C., and separating resulting acetophenone and formaldehyde. No. 2,197.101. Philip Eaglesfield to The Distillers Company, Ltd.

Method for hydrocarbon synthesis. No. 2,197,257. Robert E. Burk to the Standard Oil Co., a corporation of Ohio.

Preparation acrolein comprising reacting propylene with mixture of mercuric sulfate and water which has acidity equivalent to not more than 15% by weight of H_2SO_4. No. 2,197,258. Alexander D. Maccullum to E. I. du Pont de Nemours & Co.

Process removing soap from substantially anhydrous mixtures thereof with an ester of fatty acid. No. 2,197,339. Chester M. Gooding and Hans W. Vahlteich to The Best Foods, Inc.

Process removing a soap from mixtures of the soap with fatty acid ester of a polyhydric alcohol. No. 2,197,340. Chester M. Gooding and Hans W. Vahlteich to The Best Foods, Inc.

Condensation products of aminotrazine, aldehyde, and alcoholic group containing compounds and processes of making same. No. 2,197,357. Gustav Widmer and Willi Fisch to Ciba Products Corp.

Process of making vinegar from dextrose. No. 2.197,517. Rolland F. Cohoes, Jr., to Corn Products Refining Co.

Acylated indenes and polymerization products thereof and processes of preparing the same. No. 2,197,710. Anderson W. Ralston, Robert J. Vander Wal and Stewart T. Bauer to Armour & Co.

Polymerized acylated coumarones. No. 2,197,711. Anderson W. Ralston, Robert J. Vander Wal and Ervin W. Segebrecht to Armour & Co.

Metals, Alloys

In electrodepositing metals, improvement comprising electrolyzing aqueous solution containing metal to be deposited on an alkyl aromatic sulfonic acid compound of benzene series. No. 2,195,409. Lawrence H. Flett to National Aniline & Chemical Company.

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Process for producing boron-copper alloys. No. 2,195,433. Horace F. Silliman to The American Brass Company.
Copper base alloy comprising 1-50% zn, .01-1% B, and balance Cu. No. 2,195,434. Horace F. Silliman to The American Brass Company.
Hot workable copper alloy comprising .1-20% Sn, .05-.5% B, balance substantially Cu. No. 2,195,435. Horace F. Silliman to The American Brass Company.
Electrodeposition of copper. No. 2,195,454. Lawrence Greenspan to Louis Weisberg, Inc.
Process coating metal comprising electro-plating said metal with copper and chromium, and thereafter maintaining said metal at melting temperature of copper for a short time. No. 2,195,499. Joseph K. Schofield.
Zinc base alloy, .05-.4% al., .0004-.009% mg., balance high grade zn. No. 2,195,566. Lincoln S. Gifford and Harold L Maxwell to The American Zinc Products Company.
Alloy steel for the manufacture of motor valves. No. 2,195,601. George R. Rich to Rich Manufacturing Corp.
Process concentrating ore containing at least one non-sulfide non-silicon bearing mineral, at least one metalliferous sulfide mineral, and at least one silicon-bearing gangue mineral. No. 2,195,724. Antoine M. Gaudin & John Dixon Vincent.
Process for the production of low carbon metals and alloys. No. 2,195,961. Ture R. Haglund.
In making bimetallic body, steps consisting in electrodepositing thick layer of copper over steel base, hot drawing said body under non-oxidizing conditions to reduce bimetallic body to thickness of base, thereby to compact and homogenize the copper. No. 2,196,002. Leslie C. Whitney and John A. Heidish to Copperweld Steel Co.
Hard alloys and method for producing the same. No. 2,196,009. Walther Dawihl and Karl Schroter to General Electric Co.
Hard aluminum solder of high melting point containing about 65% Zn, 30% Al, 5% Si. No. 2,196,034. Richard Schulze to General Electric Company.
Method removing cadmium from lead, tin, and alloys thereof. No. 2,196.050. Gustave E. Behr to National Lead Co.
Method of producing heat-treated cast iron alloys. No. 2,196,084. Wm. J. Sparling to Chain Belt Co.
Process protecting magnesium and its alloys from corrosion, comprises subjecting surface to anodic oxidation in bath containing caustic alkali and thereafter subjecting to vitrifying treatment with a soluble silicate. No. 2,196,161. Jean Frasch, one-half to Samuel Fratkine.
Process protectively coating metal comprises applying thereto a carbonaceous underlayer, cooking same into adherent residual coating on the metal, and then applying overlayer of tarry bituminous material. No. 2,196,172. Howard J. Billings, Harry A. Buron, John Petty to Florence Pipe Foundry & Machine Co.
Process for welding ferrous metals. No. 2,196,192. Ward Holt Broadfield to Broadfield Metals Corp.
Bearing metal alloy containing about 1-10% Pb, 1-10% Sb. .1-3% Si, balance substantially all A1. No. 2,196,236. Eugen Vaders to Vereinigte Deutsche Metallwerke Aktiengesellschaft.
Method inhibiting corrosion of metals by coating with fluid containing a dibenzylamine compound. No. 2,196,261. Louis H. Howland and William P. ter Horst to United States Rubber Co.
Silver and copper alloys. Nos. 2,196,302-307. Franz R. Hansel, Kenneth L. Emmert and James W. Wiggs to P. R. Mallory & Co., Inc.
Method increasing rate of subsidence and deposition of flour gold from mixture of placer ground and water. No. 2,196,457. Maurice Constant.
Nickel base alloy. No. 2.196,699. Russell Franks to Haynes Stellite Co.
Process for recovery silver suitable for photographic purposes from waste liquids by using alkali hydroxide. No. 2,196,764. John H. Folwell to Eastman Kodak Co.
Permanent magnet consisting of iron, nickel and copper. No. 2,196,-824. Otto Dahl, Joachim Pfaffenberger and Paul Melchoir to General Electric Company.
Bronze bearing and method of manufacture. No. 2,196,875. Louis Sandler and Louis G. Klinker to Johnson Bronze Co.
Process of treating siderite ore and recovering metallic iron. No. 2,197,085. Alexander Thomas Stuart.
Method of treating ore containing chromium and iron oxides comprises reducing substantial proportion of the iron oxides without reducing chromium oxides. No. 2,197,146. Hendrik W. B. de W. Erasmus and Clarence E. Cormack to Electro Metallurgical Company.
Method treating ores containing iron and nickel. No. 2,197,185. Alan Kissock.
Method processing vanadium ore containing vandates to extract vanadium compounds therefrom. No. 2,197,241. George A. Hatherell to Frank A. Garbutt.
Method of and apparatus for adding lead to steel. No. 2,197,259. John Hunter Nead to Inland Steel Co.
Process for extracting silver from ores, concentrates, or other materials. No. 2.197,272. Harold Eugene Lee and Barton Robert Muir to Bunker Hill & Sullivan Mining & Concentrating Co.
Method of casting molten ferro-alloy to produce solid ferro-alloy for use in manufacture of alloy irons and steels. No. 2,197,660. Huck V. Glunz and Ernst C. Painter to Ohio Ferro-Alloy Corp.

Paper and Pulp

Method of sizing paper. No. 2,195,600. Arthur Reilly to S. D. Warren Company.
Apparatus for continuous treatment of wood pulp, cellulose and similar material with bleaching liquid, alkali, or other chemicals. No. 2,195,680. Johan Christoffer and Fredrik Carl Richter to Aktiebolaget Kamyr.
Method making starch sized paper. No. 2,197,463. Donald B. Bradner to The Champion Paper and Fibre Company.

Petroleum

Stable mineral oil and method of preparing the same. No. 2,195,659. Bernard H. Shoemaker to Standard Oil Co. (Corp. of Ind.).
Well drilling mud conditioner and method. No. 2,195,752. Jolly W. O'Brien to National Lead Co.
Drilling fluid comprising water carrying heavy solids in suspension and nicotine in solution. No. 2,195.798. Philip H. Jones and Arthur L. Blount to Union Oil Company of California.
Method removing salt water or brine from hydrocarbon oil comprises extraction with superheated water. No. 2,195,833. Charles Wirth to Universal Oil Products Co.
Method controlling internal corrosion in pipes carrying light petroleum fractions. No. 2,195,989. Edward L. Hoffman to Socony-Vacuum Oil Company.
Improved method dewaxing a mineral oil. No. 2,196,374. Jones I. Wasson and Anthony H. Gleason to Standard Oil Development Co.
Method making high quality motor fuel out of olefin-containing gases and paraffinic hydrocarbon gases. No. 2,194,831. Carl Max Hull and Ford H. Blunck to Standard Oil Company (Corp. of Ind.).
Stabilized mineral oil composition. No. 2,196,963. Everett W. Fuller to Socony-Vacuum Oil Co., Inc.
Apparatus for producing lower boiling hydrocarbons from charging material containing both easily and difficultly vaporizable higher boiling compounds. Nos. 2,197,007-009. Arthur E. Pew, Jr., to Houdry Process Corporation.
Process for production lower boiling hydrocarbons from a wide boiling range charge composed largely of higher boiling hydrocarbns. No. 2,197,-008. Arthur E. Pew to Houdry Process Corp.
In process for converting hydrocarbon gases to hydrocarbons of gasoline boiling range, steps of suddenly chilling reaction products from such conversion processes to temperature not substantially in excess of 600° F. No. 2,197,197. Hermann C. Schutt to The Pure Oil Co.
Use of solvent liquids in cracking heavy residual oils. No. 2,197,460. Gale L. Adams to Socony-Vacuum Oil Co.
Method of inhibiting gum formation in liquid hydro-carbons. No. 2,197,477. Willard E. Lyons and Walter S. Guthmann to Hendricks Research Corp.
Mineral oil containing, as pour point depressor, an acylated coumarone, the acyl group having at least 12 C atoms. No. 2,197,712. Anderson W. Ralston and Everett J. Hoffman to Armour and Company.
Mineral oil containing, as pour point a depressor, an acylated indene, the acyl group having at least 12 C atoms. No. 2,197,713. Anderson W. Ralston and Everett J. Hoffman to Armour and Company.

Pigments

Reissue. Process making tinted titanium pigment. No. 21,427. Robert M. McKinney and Carlton E. Smith to E. I. du Pont de Nemours & Co.
Preparation pigmentary calcium sulfate from H_2SO_4 solution containing iron in ferrous state comprises reacting with Ca CO_3 and subsequent treatment. No. 2,197,003. Kenneth S. Mowlds to The Glidden Company.
White pigment consisting essentially of chemically combined oxides of Pb, Zn, Al and B. and method of making same. No. 2,197,604. Louis E. Barton.
Method making substantially pure opaque white lead silicate pigment. An opaque white pigment consisting of chemically combined oxides of Pb, Zn, and Si. An opaque white pigment consisting of oxides of Pb, Zn and Si and containing 45-81% lead oxide, 5-22% zinc oxide and balance silica. No. 2,197,605. Louis E. Barton.

Resins, Plastics

Artificial heat-setting resin obtained by fusing an organic amine and laevulinic acid. No. 2,195,570. Almon G. Hovey and Theodore S. Hodgins to Reichhold Chemicals, Inc.
Molding compound comprising moldable synthetic resin adapted to be hardened under heat and pressure and filaments of glass having diameter not exceeding .02 millimeter distributed therethrough to increase mechanical strength. No. 2,195,033. Hans Schuhmann to General Electric Company.
Process increasing resilience of fabrics having basis of materials selected from group consisting of natural cellulose, regenerated cellulose and organic derivatives of cellulose. No. 2,196,256. Henry Dryfus, Donald Finlayson and Richard Gilbert Perry to Celanese Corporation of America.
In process for producing plastic moldable product from natural lignocellulosic material, a step comprising addition of an aromatic amine. No. 2,196,277. Arlie W. Schorger and John H. Ferguson to Burgess Cellulose Company.
Condensation product from phosgene and acetylene compounds and process of preparing the same. No. 2.196,445. Anderson W. Ralston to Armour & Company.
Process forming plastic sheet stock of a vinyl resin. No. 2,196,577. Lauchlin M. Currie and Leon K. Merril to Carbide & Carbon Chemicals Corp.
Method making rubbery polymer of an unsaturated ketone having general formula

$$\begin{array}{l} R_1=C-C-R_2 \\ \qquad\ \ \| \quad \| \\ \qquad\ \ O \ \ CH_2 \end{array}$$

where R_1 is hydrocarbon group and R_2 member of class consisting of hydrogen and alkyl groups. No. 2,196,714. Victor E. Wellman to B. F. Goodrich Co.
Manufacture of artificial masses from polyvinyl chloride. No. 2,196,-803. Georg Wick to I. G. Farbenindustrie Aktiengesellschaft.
Bonding olefin polysulfide plastics to flexible bases. No. 2,197,127. Ernst Eger to United States Rubber Co.
Reinforced plastic structure and method of making same. No. 2,197,132. Victor Lougheed.
Composition of matter comprising polyvinyl acetal resin and tetrahydrofurfuryl oxalate as a plasticizer therefor. No. 2,197,420. Henry B. Smith to Eastman Kodak Co.
Composition of matter comprising polyvinyl acetal resin and tetrahydrofurfuryl tetrahydrofuroate as a plasticiser therefor. No. 2,197,421. Henry B. Smith and Donald R. Swan to Eastman Kodak Co.
Resinous acid-amine condensation product and process of making the same. No. 2,197.723. Almon G. Hovey and Theodore S. Hodgins to Reichhold Chemicals, Inc.
Resinous molding composition from synthetic aldehyde resins and hydrolized ligno-cellulose. No. 2,197,724. Almon G. Hovey and Theodore S. Hodgins to Reichhold Chemicals, Inc.

Rubber

Production sponge rubber comprises heating rubber, sulfur and an accelerator in presence of bis(imino, amino, methyl) disulfide. No. 2,195,623. Marion W. Harmon to Monsanto Chemical Co., St. Louis.
Process of producing vulcanized articles from latex. No. 2,195,827. Albert O. Ryan to the Barrett Company.
Manufacture improved vulcanized rubber comprises incorporating 4-methoxy-4'-methyl-N-methyldiphenylamine. No. 2,196,719. William Baird, Richard F. Goldstein, Maldwyn Jones and Edwin M. Meade to Imperial Chemical Industries. Ltd.
Continuous process for manufacturing rubber treads, strips, and the like. from latex. No. 2,197,087. Harry Logue Welker and Frits Cremer to Harry Logue Welker.
Process of manufacturing rubber thread and the like. No. 2,197,088. Harry Logue Welker and Frits Cremer to Harry Logue Welker.
Method vulcanizing rubber in presence of alpha thioacyl-thio-cyclohexanone. No. 2,197,570. Joy G. Lichty to Wingfoot Corp.

Method vulcanizing rubber in presence of reaction product of N-halo imide of a dicarboxylic with a dithiocarboxylic acid. No. 2,197,574. George W. Watt to Wingfoot Corp.

Textiles

Manufacture and treatment of textile materials. No. 2,195,564. Donald Finlayson and Richard G. Perry to Celanese Corporation of America.

Production dark colored textile materials containing organic derivative of cellulose. Nos. 2,195,584-585. George W. Seymour and Victor S. Salvin to Celanese Corporation of America.

Production protein-containing artificial threads, filaments, etc. Comprises extruding solution of alkali salt of protein into acid precipitating bath. No. 2.195,930. Theodoor Kock to American Enka Corporation.

Thread-guide funnel for use in manufacture rayon threads and like. No. 2,195,934. Adrian J. L. Moritz to American Enka Corporation.

Production of an aniline black type of coloration on textile material. No. 2,196,270. Robert W. Moncrieff and Albert W. Cook to Celanese Corporation of America.

Fabric printing composition comprises 26 parts ester gum modified xylenol-trioxymethylene resin, 14 parts chinawood oil, 18 parts ethyl glycol acetate, and 6 parts ethyl alcohol. No. 2,196,435. Maurice Belloc to Societe Nobel Francais.

Felted product formed from thermoplastic substance treated fabrics. No. 2,196,469. William J. Moeller, Harold W. Greider and Marion F. Smith to The Philip Carey Mfg. Co.

Process for producing soft luster artificial silk. No. 2,196,630. August Hartmann to American Bemberg Corporation.

Yarn conditioning process comprises applying lubricating and softening component containing ether acetal as essential component. No. 2,196,744. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Processes for conditioning yarns to render them more amenable to textile operations including knitting, weaving, spinning and the like. Nos. 2,196,747-748-750-752-753-754-755-756-758. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Product for printing textile yarns and fabrics. No. 2,196,958. Moses L. Crossley, Roy H. Kienle and Chester A. Amick to American Cyanamid Company.

Method processing silk comprises treatment with metallic salt of group consisting of Cd, Bi, Sb, Co, Al whereby adherent properties of sericin are removed while retaining the sericin on the fiber and without destroying hygroscopic properties of the silk fiber. No. 2,196,986. Alessandro Gandini.

In production of knitted fabrics from artificial yarn, steps of crinklin yarn of organic ester of cellulose containing paradichlorobenzene as plasticizer by hot aqueous treatment. No. 2,197,035. Henry Dreyfus.

Elastic fabric and method of production. No. 2.197,188. Samuel C. Lilley to The American Mills Co.

Article of manufacture, a fiber comprising casein, salts of casein, and amyl lactate. No. 2,197,246. Earle O. Whittier and Stephen P. Gould to free use of People of United States of America.

Recovery of wool by carbonization. No. 2,197,360. Colver P. Dyer to Monsanto Chemical Co.

Process improving textile fabrics comprises treating in a bath containing high molecular base and dispersing agent of groups consisting of ethers and esters free from acid groups and containing aliphatic radicle of at least 10 C atoms. No. 2,197,464. Karl Brodersen, Matthias Quaedvlieg, Max Zabel and Albert Schneider to Farbenindustrie Aktiengesellschaft.

Continued from last month

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Resins, Plastics

Process reacting thermoplastic resin with formaldehyde in presence of acid catalyst. No. 2,191,587. E. I. du Pont de Nemours & Co.

Production nitrogenous condensation products of anthrone series. No. 2,191,685. General Aniline & Film Corp.

Method and means for eliminating weld line during thermoplastic molding. No. 2,191,703. The Standard Products Company.

Production water-soluble condensation products. No. 2,191,737. I. G. Farbenindustrie Aktiengesellschaft.

Condensation product of formaldehyde, aliphatic glycol, saturated aliphatic ditertiary diamine and non-oxidizing inorganic anhydrous acid. No. 2,191,573. E. I. du Pont de Nemours & Co.

Method making fusible ketone-aldehyde synthetic resins. No. 2,191,802. Emil E. Novotny and George Karl Vogelsang.

Production urea-formaldehyde molding composition. No. 2,191,949. Plaskon Company, Inc.

In process for making resins, steps comprising heating in presence of catalyst at atmospheric pressure a reaction mixture consisting essentially of a monohydric aliphatic alcohol and reaction product obtained from urea and formaldehyde. No. 2,191,957. E. I. du Pont de Nemours & Co.

Urea-formaldehyde molding composition an process of making same. No. 2,191,960. Plaskon Company, Inc.

Polymerization and condensation process catalyzed by means of dihydroxyfluoboric acid and dihydroxyfluoboric acid-boron fluoride addition compounds. No. 2,192,015. E. I. du Pont de Nemours & Co.

Method making plastic composition includes steps of mixing 100 parts lignin, 11 parts phenol and 132 parts benzol, kneading mass and removing solvent and unreacted phenol. No. 2,192,030. General Electric Co.

Manufacture new condensation products comprising treating pyridinium compounds with polymerizing compound from the class consisting of aldehydes and methylolureae. No. 2,192,085. Chemical Works formerly Sandoz.

Process making resinous product comprises reacting urea and formaldehyde in certain proportions under certain conditions. No. 2,192,129. Ellis-Foster Company.

Resinous body consisting essentially of a product resulting from decomposition licanic acid by heating to 200-300° C. No. 2,192,152. Devoe & Raynolds Co.

Preparation acid-reacting products from condensation product of alcohol amine and higher carboxylic acid substance. No. 2,192,664. Ninol, Inc.

Production condensation product of a phosphonitrilic chloride with an organic compound containing a substituent from group consisting of -OH and -SH. No. 2,192,921. The Atlantic Refining Company.

Method producing resin soluble in alcohol but substantially insoluble in light petroleum hydrocarbons. No. 2,193,026. Hercules Powder Company.

Light filter made of synthetic resin group consisting of polyvinyl acetaldehyde acetals. No. 2,193,035. Eastman Kodak Company.

Joining, connecting and assembling hardened plastic parts. No. 2,193,-306. Tinnerman Products, Inc.

Process of manufacturing plastic objects of contrasting colors. No. 2,193,586. National Fabricating Company.

Thermosetting molding composition comprising formaldehyde -urea reaction product and carbamized as a latent accelerator. No. 2,193,621. Plaskon Company, Inc.

Method making composite structures from gypsum and formaldehyde-urea resin. No. 2,193,635. Plaskon Company, Inc.

Composition comprising gamma polyvinyl chloride, plasticizer for same, and alkoxyalkyl ester of a higher aliphatic carboxylic acid of at least 10 C atoms. No. 2,193,662. The B. F. Goodrich Company.

Formaldehyde-urea molding composition comprising lubricant selected from group consisting of cadmium stearate and cadmium polmitate. No. 2,193,670. Plaskon Company.

Polycyclic condensation products and intermediate products thereof. No. 2,193,674. Winthrop Chemical Company.

Lens for correcting defective vision comprising a polymerized lower alkyl ester of methocrylic acid. No. 2,193,742. Rohm & Haas Company.

Improvement in production hydrocarbon resins by polymerization with Friedel-Crafts catalyst, comprises adding coal-tar material prior to complete polymerization of cracked petroleum distillate. No. 2,193,792. Monsanto Chemical Co., St. Louis.

Process for improving stability and associated characteristics of polyvinyl acetal resin. No. 2,194,205. Eastman Kodak Company.

Method and apparatus for shaping thermoplastic rods, tubes, and the like. No. 2,194,313. Evarts G. Loomis.

Production of condensation products suitable as assistants in the lacquer and related industries. No. 2,194,429. I. G. Farbenindustrie Aktiengesellschaft.

Condensation product of 1,2,2-trimethyle-cis-cyclopentant-dicarboxylic-acid-(1,3), a tertiary aliphatic amine and an aliphatic polyoxy carboxylic acid with 6 C atoms. No. 2,194,468. Roger Fischer.

Plastic composition and method of molding the same. No. 2,194,579. B. B. Chemical Co.

Process making partial polyvinyl acetal resins. No. 2,194,613. Union Carbide & Carbon Corp.

Resinified soya bean oil product and process of making same. No. 2,194,894. Ellis-Foster Company.

Nitrogenous condensation product and process of producing same. No. 2,194,906. I. G. Farbenindustrie Aktiengesellschaft.

Method stabilizing polyvinyl-formaldehyde resinous product against heat and oxygen. No. 2,195,122. General Electric Company.

Production pigment of improved strength and high fastness towards light. No. 2,195,258. E. I. du Pont de Nemours & Co.

Glycol-maleic acid resin and process of making same. No. 2,195,362. Ellis-Foster Company.

Polysulfide plastic and process of making. No. 2,195,380. Thiokol Corporation.

Rubber

Process vulcanizing rubber comprises heating rubber and sulfur in presence of R-S-NH-R' where R is arylene thiazyl group and R' is hydrocarbon radical from group consisting of cyclohexyl, benzyl and hexahydrobenzyl radicals. No. 2,191,656. Monsanto Chemical Co., St. Louis.

Method preserving rubber with a product obtained by catalytic heating of a ketone and a primary amino substituted diaryl thio ether. No. 2,191,664. Monsanto Chemical Company.

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Process forming chlorinated rubber products. No. 2,191,748. Imperial Chemical Industries, Ltd.

Method removing from hot vulcanized mold an article containing gas under high pressure generated as from a chemical tablet by the heat of the vulcanizing process, consists in first piercing article and permitting gas to escape, then removing from mold. No. 2,192,507. Frederick H. Schavoir.

Production colored rubber-cloth comprises coating textile fabric with fluid rubber composition containing water-insoluble phthalocyanine coloring matter and then vulcanizing rubber in coating by exposure to sulfur chloride. No. 2,192,705. Imperial Chemical Industries, Ltd.

Laminated sheet material comprising transparent, flexible base joined to layer of filled uncured rubber composition by means of intermediate film of alkyd resin containing rosin. No. 2,192,708. E. I. du Pont de Nemours & Co.

Method for the production of rubber or elastic yarn filaments. No. 2,192,938. Thomas Lewis Shepherd.

Process reclaiming rubber scrap comprises heating at at least 100° C. in presence of a thiophenol. No. 2,193,624. The B. F. Goodrich Company.

Antioxidant for retarding deterioration of rubber. No. 2,193,650. B. F. Goodrich Company.

Process vulcanizing rubber in presence of various accelerators. Nos. 2,193,651-656-773-774, The B. F. Goodrich Company.

Method improving age resisting properties of rubber, comprises treating same with a secondary naphthyl glucomine. No. 2,193,748. J. R. Geigy, S. A.

Textiles

Manufacture of stiff, woven fabrics such as organdie comprises subjecting cellulose acetate containing yarns to action of alcohol solution. No. 2,191,534. Celanese Corporation of America.

Material for abrasive uses comprising flexible base of textile threads, a granular abrasive and an adhesive. No. 2,191,803. Western Electric Company.

Process rendering textile material water-repellent by treating with aromatic orthohydroxy carboxylic acid compound containing a hydrophobe radical and a water soluble complex forming metal compound selected from group consisting of chromium and zirconium. No. 2,191,982. I. G. Farbenindustrie Aktiengesellschaft.

Manufacture of artificial threads, filaments, and the like by the viscose process. No. 2,192,074. Courtaulds Limited.

Process for manufacturing artificial fiber from protein contained in soya bean. No. 2,192,194. Showa Sangyo Kabush Iki.

Method of determining the grease content of fibers. No. 2,192,614. American Chemical Paint Company.

Step in method of treating hosiery comprises precipitating a protein material in the hosiery. No. 2,192,919. The Institute of Paper Chemistry.

Process improving discharge effects on cellulose ester or ether textile materials. No. 2,192,958. Celanese Corporation of America.

Process for production of fabrics exhibiting colored effects. No. 2,192,-984. Celanese Corporation of America.

Monocapillary silk suture and method of preparing the same. No. 2,193,188. American Cyanamid Company.

Process inhibiting tendering in cotton and other cellulosic fibers dyed with sulfur block comprises treating said fibers in absence of oxidizing agent with solution containing a certain amine. No. 2,193,328. Southern Dyestuffs Corporation.

Method producing plissé crepe and like fabric in continuous operation. No. 2,193,340. Hampton Company.

Manufacture of elastic fabrics. No. 2,193,496. American Ecla Corp.

Process for coating or sizing fibers and fabrics consists in impregnating with material protein solution obtained from soya beans. No. 2,193,818. Showa Sangyo Kabushiki Kaisha.

In method forming spun yarn of organic esters of cellulose, step of subjecting materials to treatment with saponifying agent. No. 2,193,894. Celanese Corporation of America.

Machine for the production of looped fabrics. No. 2,193,969. Edouard Doubied & Cie.

Production resiliently deformable article comprises causing a dispersion with characteristics like rubber to extend itself through the interstices of a fibrous material and then setting the substance. No. 2,194,036. Josef Anton Talalay, asignor of 1/3 to The Moulded Hair Company, Ltd.

Method treating relatively high denier, continuous-filament, rayon roving. No. 2,194,084. New Process Rayon, Inc.

Knitted fabric containing plurality of yarns each with longitudinal repeated color patterns. No. 2,194,271. Herman Epstein.

Process for bleaching artificial textile fibers comprising steps of impregnating fibrous material with solution containing a peroxygen compound. No. 2,194,358. Deutsche Gold und Siber Scheideanstalt.

Process, desulfurizing viscose rayon. No. 2,194,470. North American Rayon Corporation.

Composition of matter for treatment textile material comprises a bath for desizing and increasing wettability of material containing a diastatic enzyme, and lecithin in an amount of .005 to .04% and having a Lintner value of about 3°. No. 2,194,932. Standard Brands, Inc.

Method lubricating and softening textile materials comprises applying an ester of naphthenic acids with an aliphatic alcohol. No. 2,195,131. National Oil Products Company.

Process improving fibrous material comprising treatment with compound selected from the class consisting of amines. No. 2,195,194. I. G. Farbenindustrie Aktiengesellschaft.

Abstracts of Foreign Patents

By E. L. Luaces, Chemical Consultant

To assist those making use of this summary, it might be well to comment briefly on the system used by each of these countries in reporting patents.

Canada grants the patent on the date of publication. It does not print the patents, but supplies typewritten certified copies at a cost averaging about five dollars each.

English "patents" here reported are known as *Complete Specifications Accepted* and are open to opposition by interested parties for a period of two months from date of publication. Printed copies may be obtained at ls. ld. each.

French patents are granted several months before publication, and the printed report issued several days or even weeks after its date. Printed copies may be obtained at 10 francs each.

Belgian patents, like French, are granted long before publication. The report comes out 12 times each year, and photostatic copies can be obtained at from 3.50 to 4.50 francs per page.

In this digest the latest available data will be published, but it will be understood that some delay will occur as a result of present conditions in Europe. The German patents will be reported just as soon as we are sure of uninterrupted service.

We shall be glad to receive comments or criticisms.

CANADIAN PATENTS

Granted and Published March 19, 1940.

Alloy steel characterized by low hot oxidation and corrosive loss when subjected to attack by lead containing compounds at temperatures of combustion engine exhaust valves. No. 387,474. Walter R. Breeler.

Production of double fluoride of alkali metal and aluminum by treating a hydrofluoboric acid compound with an alkali metal aluminate and an alkali metal compound sufficient to provide 3 atoms of alkali metal to each of aluminum. No. 387,500. Aluminum Company of America.

Making a porous carbon article impervious by impregnating with sulfur chloride and a liquid furan and resinifying said furan *in situ*. No. 387,514. Canadian National Carbon Co., Ltd.

Glycol monoester and acylated hydroxy acid ester and process of making. No. 387,516. Carbide and Carbon Chemicals, Ltd.

Glycol and acylated hydroxy acid ester and process of manufacture. No. 387,517. Carbide and Carbon Chemicals, Ltd.

Method of forming alkyl halides by reacting dialkyl sulfates with alkaline earth metal halides at about 100° C. No. 387,518. Carbide and Carbon Chemicals, Ltd.

Fully austenitic chrom-nickel steel. No. 387,527. Electro Metallurgical Co. of Canada, Ltd.

Magnetic steel sheet. No. 387,528. Electro Metallurgical Co. of Canada, Ltd.

Process of manufacturing 1-methyl-4-amino-5-cyanopyrimidine. No. 387,533. F. Hoffman-LaRoche & Co. Limited Company.

Nickel alloy containing deoxidizing substances. No. 387,536. The International Nickel Company, Inc.

Heat resisting alloy containing rare earth metal. No. 387,537. The International Nickel Company, Inc.

Improving workability of nickel and nickel alloys by addition of an alkali earth metal and one of group V of the periodic table. No. 387,538. The International Nickel Company, Inc.

Production of carbonized surface on nickel and nickel alloys. No. 387,539. The International Nickel Company, Inc.

Product consisting of a flexible, non-porous, transparent plastic material and attenuated glass fibres embedded therein. No. 387,547. Owens-Corning Fiberglas Corp.

Method of producing glass wool, and apparatus therefor. No. 387,548. Owens-Corning Fiberglas Corp.

Method of treating a fabricated body of fibrous glass. Nos. 387,549 and 387,550. Owens-Corning Fiberglas Corp.

Olefin oxide production by reacting ethylene and oxygen in contact with a catalyst of silver on aluminum oxide, and selectively absorbing the ethylene oxide. Nos. 387,564 and 387,565. U. S. Industrial Alcohol Company.

Recovery of olefin oxide from gaseous mixture by scrubbing said mixture with an aqueous liquid absorbent and heating to convert olefin oxide to glycol. No. 387,566. U. S. Industrial Alcohol Company.

Production of iron oxide and zinc sulfate. No. 387,569. C. K. Williams & Co.

Preparation of hydrated iron compound and zinc sulfate. No. 387,570. C. K. Williams & Co.

Coloration of textiles, films and foils by applying a leuco compound of a vat dyestuff in an organic liquid containing an organic base, and oxidizing the leuco compound to vat dyestuff on the material. No. 387,573. (See also No. 387,574.) Henry Dreyfus.

Apparatus for removal of nitrogen oxides from inert gaseous combustion products. No. 387,580. Charles L. Coughlin.

Granted and Published March 26, 1940.

Production of transparent coated wrapping material. No. 387,583. Maurice F. Moubiot and John R. E. Stoddard.

Dehumidification of gas by contact with an aqueous solution of lithium bromide and one or more of the group: lithium chloride, calcium chloride and calcium bromide. No. 387,640. The Dow Chemical Company.

Aqueous dispersion of rubber and a polymer of chloro-2-butadiene-1, 3 and a water soluble salt of a sulfuric acid ester of a normal straight-chain primary aliphatic alcohol having 8 to 18 carbon atoms. No. 387,641. E. I. du Pont de Nemours & Co.

Polymerization of olefine by treating gaseous olefines with hot aqueous polymerizing reagent, removing from said reagent, by azeotropic distillation, the dimeric olefine as soon as formed. No. 387,650. Usines de Melle.

Process for producing sorbose from a crystalline hexahydric alcohol. No. 387,652. Merck & Co., Inc.

Method of producing glass fibre. No. 387,658. Owens-Corning Fiberglas Corp.

Apparatus for producing glass fibre. Nos. 387,659 and 387,660. Owens-Corning Fiberglas Corp.

Foam-forming fire-extinguishing apparatus and method of producing foam. No. 387,665. Pyrene Minimax Corporation.

Copper alloy having high degree of toughness and capable of being worked hot or cold, hot extruded, and hardened by heat treatment. No. 387,667. Revere Copper & Brass Co.

Method of increasing the form-stability of polyvinyl resins. No. 387,669. Shawiningan Chemicals, Ltd.

Purification of fatty acid derivatives. No. 387,670. Shell Development Co.

Recovery of an alcohol from a reaction mixture containing hydrocarbon and an inorganic polybasic acid incompletely miscible therewith. No. 387,671. Shell Development Co.

Treatment of dry-cleaning fluid with activated magnesia for reclaiming said fluid. No. 387,685. Westvaco Chlorine Products Corporation.

Coloration of cellulose ester by coupling thereon a diazotized amino-azo compound or a diazotized amino-diarylamine with a hydroalkyl aniline capable of coupling in para position to the amino group. No. 387,694. Henry Dreyfus.

Granted and Published April 2, 1940.

Apparatus for the flotation of ores. No. 387,719. Robert G. Hall.

Separation of minerals. No. 387,750. Canadian Industries, Limited.

Process of coloring organic derivatives of cellulose No. 387,751. Canadian Kodak Co., Ltd.

Method of preparing piperazine by heating diethylene triamine in presence of one of its pertial hydrohalides. No. 387,755. Carbide and Carbon Chemicals, Ltd.

Device for injection molding of synthetic thermoplastic material. No. 387,756. Celluloid Corporation.

Apparatus for degassing organic liquids. No. 387,760. Distillation Products, Inc.

Separation of lower alkyl ether of cellulose from the product obtained by reacting alkali cellulose with an etherifying agent at elevated temperature and pressure. No. 387,764. The Dow Chemical Company.

Method of bleaching fur. No. 387,765. E. I. du Pont de Nemours & Co., Inc.

Separation of minerals. Nos. 387,767; 387,768; 387,772 to 387,774, inclusive. E. I. du Pont de Nemours & Co., Inc.

Method of lubricating projectiles and lubricant therefor. No. 387,769. E. I. du Pont de Nemours & Co., Inc.

Application of anti-sticking agent to a film cast from aqueous cellulosic solution. No. 387,770. E. I. du Pont de Nemours & Co., Inc.

Coating of metal with polyvinyl alcohol. No. 387,771. E. I. du Pont de Nemours & Co., Inc.

Process for preparing organic-soluble mixed non-olefinic aliphatic methallyl ethers of cellulose. No. 387,775. E. I. du Pont de Nemours & Co., Inc.

Separation of primary, secondary and tertiary lower alkylamines. Nos. 387,781 and 387,782. The Girdler Corporation.

Edible dusting powders. No. 387,784. The Griffith Laboratories, Ltd.

Electrical resistance iron alloy. No. 387,794. Kemet Laboratories Co., Inc.

Ergot derivative. No. 387,795. Eli Lilly and Co.

Dehydrogenation of aliphatic hydrocarbons to produce unsaturated derivatives thereof. Nos. 387,807 and 387,808. Universal Oil Products Company.

Process of forming water insoluble diaromatic peroxides. No. 387,813. Albert J. Oosterhuis.

Preparation of mixed anhydrides by reacting ketene with pyruvic acid. No. 387,821. Canadian Industries, Limited.

Size for paper manufacture comprising saponifiable material and water soluble gum, and method of manufacture. No. 387,822. Rafford International Corporation.

Foreign Chemical Patents
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Foreign Chemical Patents

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Granted and Published April 9, 1940.

Purification of cellulose material. No. 387,836. Nils W. Coster.
Treatment of artificial filaments to reduce ability to absorb moisture. No. 387,838. Henry Dreyfus.
Halogenation process. No. 387,841. Colin G. Fink.
Explosive powder made from paper mill waste liquors containing lignin. No. 387,857. Joseph E. Fleury.
Bleaching of wood with a solution of peroxide and an alcohol solution of an alkali. No. 387,865. Buffalo Electro-Chemical Co., Inc.
Process of sweetening hydrocarbon distillates. No. 387,866. Buffalo Electro-Chemical Co., Inc.
Refractory article containing one or more carbon-comprising constituents bonded with a ceramic bond comprising an oxide compound of copper. No. 387,887. The Carborundum Company.
Silver halide emulsion. No. 387,898. General Aniline & Film Corporation.
Destructive low-temperature distillation of coal, lignite, oil shale, etc. Nos. 387,935 and 387,936. Ste. Chimique de la Grande Paroisse, Azote et Produits Chimiques.
Process for producing hydrocarbon polymers of the motor fuel range. No. 387,937. Standard Alcohol Company.
Fast dyeing process for cellulose materials comprising treating the goods with solution of diazo compound having at least one aza nitrogen and at least three rings, and subsequently with a coupling component. No. 387,963. Friedrich Ebel and Karl Koeberle.
Formation of anthraquinone series compound. No. 387,965. Willy Burreleit, Walter Mieg and Franz Wieners.
Fibre dyed with an azo compound obtainable on the fibre, and the process therefor. No. 387,966 and 387,967. Werner Kirst.

Granted and Published April 16, 1940.

Manufacture of copper oxychloride and use as plant protecting agent. No. 387,978. Ricardo Sanz Carreras.
Drilling mud comprising a dispersion of clay in an aqueous solution of a water soluble anhydrous composition. No. 387,981. Allen D. Garrison.
Manufacture of phosphorus and boron compound. No. 387,982. Allen D. Garrison.
Mineral processing apparatus. No. 387,985. Fred R. Johnson.
Vitamin containing composition for feeding poultry. No. 387,991. George H. Lubarsky.
Nasal medicament for the treatment of hay fever. No. 388,005. Sol Snyder.
Hard frittered alloy. No. 388,045. Canadian General Electric Co., Ltd.
Ferro-magnetic sheet production. No. 388,051. Canadian General Electric Co., Ltd.
2-Ethylbutylidene actone and process of manufacture. No. 388,060. Carbide and Carbon Chemicals, Ltd.
Treatment of zinc ammonium chloride to increase its foam producing ability. No. 388,070. E. I. du Pont de Nemours & Co., Inc.
Flexible wire mesh coated with an interpolymer of a monomeric methacrylic acid ester and an additional monomeric methacrylic acid ester. No. 388,071. E. I. du Pont de Nemours & Co.
Apparatus for mineral separation. No. 388,072. E. I. du Pont de Nemours & Co, Inc.
Austenitic nickel-chromium alloy steel suitable for high temperatures. No. 388,076. Thos. Firth and John Brown, Limited.
Bleaching cellulosic material by introducing chlorine into an aqueous solution of a chlorite in contact with the material to be bleached. No. 388,096. Mathieson Alkali Works, Inc.
Production of unsaturated carboxylic compound. No. 388,119. Shell Development Co.
Production of capillary active sulfonium sulfate. No. 388,120. Shell Development Co.
Preparation of mercapto aryl thiozole. No. 388,132. Wingfoot Corporation.
Stabilization of dithio carbamate. No. 388,133 Wingfoot Corporation.
Production of improved textile materials. Nos. 388,136 to 388,140. C. Dreyfus.

ENGLISH COMPLETE SPECIFICATIONS

Accepted and Published March 6, 1940.

Method of treating supports having adherent aluminum thereon for the purpose of recovering the aluminum and the material of the support. No. 518,260. L. Halberstadt.
Production of refined iron and alloy steels. No. 518,261. S. Westberg.
Method of operating a polymerization plant for hydrocarbon mixtures containing olefins. No. 518,163. Sinclair Refining Company.
Apparatus for coating paper, fabrics and the like. No. 518,166. J. D. MacLaurin.
Production of urea-formaldehyde molding mixtures. No. 518,321. Bakelite, Ltd.
Manufacture of steel. No. 518,212. Stewarts & Lloyds, Ltd.
Cracking and refining hydrocarbon oils. No. 518,263. E. A. Ocon.
Production of felted fibrous material in sheet form. No. 518,362. Papercrete, Ltd.
Manufacture of hollow articles from paper-stuff or other suspensions of fibrous material in liquid. No. 518,363. Papercrete, Ltd.
Process for the manufacture of progesterone. No. 518,266. Chinoin Gyogyzer ese Vegyeszeti Termekek Gyara R. T. (Dr. Kereszty and Dr. Wolf).
Manufacture of molded or otherwise shaped articles. No. 518,220. Rohm & Haas, A. G.
Articles of synthetic material having metallic coatings. No. 518,312. R. Bosch Ges.
Porous metal objects and method of making them. No. 518,267. C. Tietig.
Treatment of textile materials, films, foils, and the like, with etherifying agents. No. 518,225. Henry Dreyfus.
Desulfurizing motor benzol. No. 518,171. Gewerkschaft M. Stinnes.
Porous drier felt for paper machines. No. 518,231. W. A. Barrell.
Coating of fruit, vegetables, nuts, eggs, and the like perishable produce prior to marketing. No. 518,189. E. I. du Pont de Nemours & Co., Inc.
Method of producing hydrogen peroxide from solutions. No. 518,191. H. Schmidt.
Production of phosphatide products which are soluble or readily dispersible in water. No. 518,194. R. Kimbara and W. Rosenthal.
Manufacture of soluble lead salts. No. 518,236. L. R. Birkenstine.
Compositions for use as insect sprays. No. 518,195. The Dow Chemical Company.
Manufacture of aralkyl ethers of polysaccharoses. No. 518,197. I. G. Farbenindustrie A. G.
Production of food powders. No. 518,237. Atomised Food Products, Ltd.
Jointing, sealing, and covering material. No. 518,242. Kenilworth Mfg. Co., Ltd.
Process for the manufacture of polyazo dyestuffs. No. 518,243. I. G. Farbenindustrie A. G.
Purification of zinc salt solutions. No. 518,245. I. G. Farbenindustrie A. G.
Separation of benzol from coke oven and the like gases. No. 518,368. G. Maiuri.
Manufacture of artificial resins, and process for animalizing fibres therewith. No. 518,369. I. G. Farbenindustrie A. G.
Carrying out the conversion of carbon monoxide with hydrogen. No. 518,372. I. G. Farbenindustrie A. G.
Treatment of sulfite waste liquors. No. 518,318. Bohm Krumauer Maschinen-Papier-Fabriken Ignaz Spiro et Sohne A. G.
Continuous solvent extraction process. No. 518,324. National Distillers Products Corporation.
Production of unsaturated halogen-containing derivatives of propene. No. 518,325. N. V. de Bataafsche Petroleum Mij.
Manufacture and production of derivatives of coronene. No. 518,332. I. G. Farbenindustrie A. G.
Production of catalysts. No. 518,334. Ruhrahemie A. G.
Hydrogenation of octenes. No 518,392. Universal Oil Products Company.
Method of and means for treating or dealing with sludge in sewage digestion tanks. No. 518,353. P. A. Leitch and J. F. Bolton.
Flotation of coal. No. 518,302. American Cyanamid Company.
Apparatus for drying a continuous web of material. No. 518,257. Firestone Tyre & Rubber Co., Ltd.
Synthetic metallic enamels. No. 518,309. L. Berger & Sons, Ltd.

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Process for the manufacture of a tubercle vaccine. No. 518,515. T. Hashimoto and F. Tsuruhara.
Treatment of liquid distillery residues. No. 518,611. J. Baudot.
Sensitized photographic emulsions. No. 518,478. Kodak, Ltd.
Adhesive tape and method of making same. No. 518,483. N. Van Cleef, P. Van Cleef and F. Van Cleef.
Manufacture of saturated and unsaturated derivatives of the 3-keto-cyclopentano-polyhydrophenanthrene series. No. 518,571. Society of Chemical Industry in Basle.
Synthesis of hydrocarbons which are solid, liquid, or readily liquefiable from carbon monoxide and hydrogen. No. 518,614. Studien- und Verwertungs-Ges.
Composite resilient materials. No. 518,490. B. F. Goodrich Co.
Method of making closed cell expanded rubber or like thermosetting compositions by internally-developed gases. No. 518,517. Expanded Rubber Co., Ltd.
Obtaining alimentary substances from edible oleaginous grains or seeds. No. 518,493. P. Ammann.
Means for obtaining metals or compounds thereof from metal bearing ores. No. 518,413. J. L. Burnett.
Recovery of metal from compound sheet material. No. 518,525. E. Junker and W. Leitgebel.
Charging cylinders for the storage of acetylene solution. No. 518,419. Ges. für Linde's Eismaschinen A. G.
Production of amidines and their derivatives. No. 518,575. Boots Pure Drug Co., Ltd.
Manufacture of washing, cleansing, bleaching, and rinsing agents. No. 518,576. Henkel & Cie. Ges.
Tubular furnace for the treatment of hydrocarbons. No. 518,537. Gasoline Products Co., Ltd.
Treatment of slag from blast and reduction furnaces. No. 518,541. Holland & Hannen & Cubitts, Ltd.
Coating of metal surfaces. No. 518,554. R. Barlow and W. Clayton.
Synthetic filaments, fibres, and articles made therefrom. No. 518,555. Carbide and Carbon Chemicals Corporation.
Process for the manufacture of polyazo dyestuffs. No. 518,509. I. G. Farbenindustrie A. G.
Phenolic sugar alcohols. No. 518.586. J. B. Niederl.
Manufacture of pancreas hormone preparations. No. 518,624. I. G. Farbenindustrie A. G.
Preparing bilirubin. No. 518,637. Armour & Company.
Manufacture of stable emulsions, such as of oil and water. No. 518.641. Neukollner Olmuhle G. P. Lehmann & Co. Ges.
Manufacture of bituminous substances. No. 518,655. Ebano Asphalt-Werke A. G.
Manufacture of amino-sulfonic and amino-carboxylic acids. No. 518,656. I. G. Farbenindustrie A. G.
Polymerization of polymerizable organic liquids. No. 518,667. E. I. du Pont de Nemours & Co., Inc.
Depolymerization of mono-olefine polymers. No. 518,558. I. G. Farbenindustrie A. G.
Manufacture of dimorpholine compounds. No. 518,592. J. R. Geigy A. G.
Manufacture of cresols and higher phenols. No. 518,450. Monsanto Chemical Company.
Insecticides. No. 518,453. Monsanto Chemical Company.
Conversion of carbon monoxide with hydrogen. No. 518,605. I. G. Farbenindustrie A. G.

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Mineral oil and process for its manufacture. No. 518,664. B. Buxbaum.
Electrolytic deposition of zinc dust. No. 518,865. Siemens & Halske A. G.
Making olefine oxides. No. 518,823. Carbide and Carbon Chemicals Corporation.
Rubber-like compositions. Nos. 518,718 and 518,719. Henley's Telegraph Works, Ltd.
Manufacture of anthraquinone dyestuffs. No. 518.725. G. H. Ellis and F. Brown.
Anhydrous monocalcium phosphate and products containing same. Nos. 518,737 and 518,738. Victor Chemical Works.
Separation of hydrogen chloride from mixtures containing olefines or diolefines. No. 518,745. I. G. Farbenindustrie A. G.
Manufacture of phenol sulfides. No. 518,775. Standard Oil Development Company.

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Polymerization of olefines hydrocarbons. No. 518,749. R. F. Ruthruff.
Making alkenyl benzenes. No. 518,685. Carbide and Carbon Chemicals Corporation.
Method for the recovery of a high-grade crude product from enriched benzol waste oil. No. 518,780. Heinrich Koppers' Industrielle Mij. N. V.
Production of hydroxyketones of the cyclopentanopolyhydrophenanthrene series. No. 518,781. Naamlooze Vennootschap Organon.
Manufacture of vat dyestuffs. No. 518,690. I. G. Farbenindustrie A. G.
Manufacture of synthetic stone. No. 518,826. Springbank Quarry Co, Ltd.
Manufacture of dichlorobutenes. No. 518,697. I. G. Farbenindustrie A. G.
Separation of hormones from aqueous liquids. No. 518,788. British Drug Houses, Ltd.
Intermediate products, new dyestuffs, and processes of obtaining same. No. 518,791. Ets. Kuhlmann.
Manufacture of abrasive coated sheet material. No. 518,833. Carborundum Co.
Apparatus for humidifying and cooling air. No. 518,882. R. A. Robic.
Manufacture of phenylpyridine derivatives. No. 518,886. Imperial Chemical Industries Limited.
Production of pulp material from wood, straw, grasses, and similar cellulose containing plants. No. 518,887. A. G. für Halbzellstoffindustrie.
Treatment of yeast, and in brewing. No. 518,889. A. M. Fisher.
Process and apparatus for the partial dehydration of hexahydrated magnesium chloride. No. 518,893. A. Hansdorff.
Process for the manufacture of azo dyestuffs. Nos. 518,896 and 518,902. I. G. Fabenindustrie A. G.
Anti-rusting solutions and methods of preparing. No. 518,900. G. Endres.
Flexible laminated material. No. 518,901. Imperial Chemical Industries, Limited.
Process for the manufacture of sulfonic acid amide compounds. No. 518,903. I. G. Farbenindustrie A. G.
Separation of minerals from ores. No. 518,852. F. L. Smidth & Co. Aktieselskab.
Manufacture of photographic sensitizing dyes and emulsions sensitized therewith. No. 518,904. Kodak, Ltd.
Treatment of textile and other shaped materials comprising cellulose organic derivatives. No. 518,908. British Celanese, Ltd.
Pulp and paper manufacture. No. 518,802. National Oil Products Company.
Production of hardened artificial resin products. No. 518,858. Albert Products, Ltd.
Production of emulsion and flexible films. No. 518,704. I. G. Farbenindustrie A. G.
Synthetic filaments, fibres, and articles made therefrom. No. 518,710. Carbide and Carbon Chemicals Corporation.

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Production of acetone and butyl alcohol by fermentation. No. 518,962. C. Weizmann.
Recovery of odorless soap-forming fatty acids. No. 518,963. I. G. Farbenindustrie A. G.
Manufacture of malonic and cyanoacetic esters. No. 518,915. Sharp & Dohme, Inc.
Treatment of cellulosic textile materials. No. 518,916. Imperial Chemical Industries, Limited.
Finishing of textile materials. No. 518,917. Imperial Chemical Industries Ltd.
Sensitized photographic emulsions. No. 519,062. Kodak, Ltd.
Manufacture of colored organic compounds. No. 519,064. Imperial Chemical Industries, Limited.
Treatment of metal surfaces. No. 518,966. H. C. Hall.
Method of producing Portland cement. No 519,018. Fuller Company.
Manufacture of polymerization products derived from acrylic acid derivatives. No. 518,970. Imperial Chemical Industries, Limited.
Presses for the manufacture of hot vulcanized rubber articles. No. 518,973. Bata Ackciova Spolecnost.
Method of preparing tetrazylazide or salts thereof. No. 519,069. Dynamit-A.-G. A. Nobel & Co.
Apparatus for carrying out catalytic gas reactions. No. 518,944. I. G. Farbenindustrie A. G.
Production of magnesium and magnesium alloys. No. 518,949. Seri Holding S. A.
Bubble caps of distilling, fractionating, and the like towers, and the flow of liquids therethrough. No. 518,983. Standard Oil Development Company.
Manufacture of benzidine. No. 518,985. E. I. du Pont de Nemours & Co., Inc.
Sulfo-carboxylic esters of alcohols of higher molecular weight, and process of producing same. No. 519,046. F. J. Cahn and M. B. Katzman.
Manufacture of synthetic rubber-like materials. No. 519,047. I. G. Farbenindustrie A. G.
Preparation of polyazo dyestuffs of complex metal compounds derived therefrom, and new industrial products resulting therefrom. No. 518,987. Ets. Kuhlmann.
Manufacture of acylamino-morpholine compounds. No. 518,989. J. R. Geigy A. G.
Water-setting plasters and cements. No. 519,078. E. I du Pont de Nemours & Co.
Apparatus for anodizing thin wire. No. 518,993. F. Durr.
Manufacture of adhesive bitumens. No. 519,119. Standard Oil Development Co.
Manufacture of carbazole compounds. No. 519,123. I. G. Farbenindustrie A. G.
Production of ice cream. No. 519,124. De-Raef Corporation.
Manufacture of coated welding rods of aluminum or aluminum alloys. No. 519,128. Vereinigte Aluminum-Werke A. G.
Recovery of precious metals lost during catalytic conversion of gases. No. 519,082. Hercules Powder Company.
Production of ice cream. No. 518,952. A. Herlow.
Rubber compositions and articles composed thereof. No. 519,095. Liverpool Electric Cable Co., Ltd.
Manufacture of derivatives of sulfonamides. No. 519,136. Boots Pure Drug Co., Ltd.
Preparation of stable aqueous solutions containing K-stropanthin, theophylline, and dextrose of concentrations suitable for injection purposes. No. 518,996. Chemisch-Pharmazeutische A. G. Bad Homburg.
Manufacture of aliphatic ethers. No. 518,998. Usines de Melle.
Concentrating the organic matter content of oil shales by flotation. No. 518,955 Visura Treuhand Ges.
Production of glass fibres. No. 519,053. N. V. Mij. tot Beheer en Exploitatie van Octrooien.
Manufacture of stable salts of acetyl-salicylic acid. No. 519,006. G. M. Dyson.
Apparatus for the production and delivery of liquefied pitch or the like. No. 519,104. Deutsche Eisenwerke A. G.
Downdraft sintering plants. No. 519,106. Thyssen-Hutte A. G.
Cleaning, descaling, and coating compound for ferrous metals, for use during hardening or tempering processes. No. 519,156. A. S. Palmer.

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Production of light-sensitive grainless silver halide colloid systems. No. 518,677. O. Czeija and F. Lierg.
Compound plates of aluminum alloys. No. 519,160. I. Igarashi and S. Hagashio.
Magnesium alloys. Nos. 519,302 and 519,304. G. von Giesche's Erben.
Alloys containing iron, chromium, silicon and carbon. No. 519,303. M. J. Udy.
Manufacture of synthetic resins. No. 519,175. I. G. Farbenindustrie A. G.
Alloys. No. 519,183. British Thomson-Houston Co., Ltd.
Manufacture of anhydrous metal fluorides free from oxide. No. 519,199. Seri Holding S. A.
Cracking or coking hydrocarbon oils. No. 519,310. N. V. Nieuwe Octrooi Mij.
Treatment of Keratin-containing fibres. Nos. 519,206 and 519,207. MacDonald Steam Waving, Ltd
Working up polyvinyl acetals. No. 519,314. Deutsche Celluloid-Fabrik A. G.
Manufacture of lined metal vessels. No. 519,315. I. G. Farbenindustrie A. G.
Manufacture of diazo dyestuffs. Nos. 519,326 and 519,327. I. G. Farbenindustrie A. G.
Manufacture of compositions of lead and its oxides. No. 519,332. Richardson Co.
Explosive and process of making the same. No. 519,340. Winchester Repeating Arms Co.
Preparation of carbon tetrachloride. No. 519,220. Consortium für Electrochemische Industrie Ges.
Preparation of salts of sulfo-carboxylic acid esters of alcohols. No. 519,230. B. R. Harris.
Manufacture of unsaturated compounds of the cyclopentanopolyhydrophenanthrene series. No. 519,233. Schering A. G.
Carbonization of carbonaceous materials. No. 519,246. Institution of Gas Engineers.
Processes for treating naturally occurring starchy materials in order to saccharify them. No. 519,268. Usines de Melle.
Removal of hydrogen sulfide from gases. No. 519,274. Courtaulds, Ltd.
Production of concentrated solutions of hydrogen peroxide. No. 519,276. H. Schmidt.
Process for the manufacture of iodo derivatives of steroid compounds. No. 519,277. B. Helferich.
Method and means of purifying air. No. 519,345. A. Shardlow & Co., Ltd.
Resinous compositions. No. 519,349. British Thomson-Houston Co., Ltd.
Dyeing of cellulose derivatives and other highly polymerized compounds. No. 519,361. Société Rhodiaceta.

FRENCH PATENTS

Granted October 16, 1939; Published November 2, 1939. Continued from April issue.

Production of gaseous olefines. No. 852,170. I. G. Farbenindustrie A. G.
High-pressure catalytic reaction apparatus. No. 852,174. P. P. Firmin and L. A. E. Gardinier.
Improvement in ammonia synthesis. No. 852,174. P. P. Firmin and L. A. E. Gardinier.
Sulfuric acid leuco-esters of anthraquinone-naphthalene-carbizols and their production. No. 851,986. I. G. Farbenindustrie A. G.
Acid dyes of the diamino-triphenyl-methane series and their manufacture. No. 852,029. I. G. Farbenindustrie A. G.
Preparation of polyazo dyes. No. 852,042. I. G. Farbenindustrie A. G.
Preparation of luminescent substances. No. 852,058. Telefunken Ges. für Drahtlose Telegraphie m.b.H.
Basic dyes of the triaryl-methane series and their preparation. No. 852,091. I. G. Farbenindustrie A. G.
Improvement in the preparation of aluminum paints. No. 852,129. P. R. Plassat.
Azo dyes and their manufacture. No. 852,131. I. G. Farbenindustrie A. G.
Preparation of anthraquinone compounds. No. 50,208/828,581*. I. G. Farbenindustrie A. G.
Preparation of sulfur dyes. No. 50,211/799,342*. I. G. Farbenindustrie A. G.
Preparation of anthraquinone vat dyes. No. 50,222/825,573*. I. G. Farbenindustrie A. G.
Preparation of diazo dyes. No. 50,248/838,085*. J. R. Geigy S. A.
Lubricating composition. No. 851,996. N. V. de Bataafsche Petroleum Mij.
Process of destructive hydrogenation of carbonaceous matters and of dephenolizing the residual waters. No. 852,043. N. V. Internationale Hydrogeneerings Octrooien Mij.
Sulfonated greasy matters and their manufacture. No. 852,077. National Oil Products Co.
Preparation of diamide and polyamide resins. No. 852,079. Vereinigte Chemische Fabriken Freidl, Hellers & Co.
Improved detergent. Nos. 852,048 and 852,049. The Mathieson Alkali Works.
Production of formaldehyde polymerisates. No. 852,157. Gutehoffnungshutte Oberhausen A. G.
Production of plastic compositions from polyvinyl compounds. No. 50,216/841,724*. I. G. Farbenindustrie A. G.

* Certificate of addition to previously granted patents. Second number is that of the original.

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Preparation from olefines of liquid polymerization products of low degree of polymerization. No. 50,223/823,373*. I. G. Farbenindustrie A. G.

Granted October 23, 1939; Published November 9, 1939.

Process for the production of light and wash fast dyes and products obtained thereby. No. 852,255. I. G. Farbenindustrie A. G.
Process for waterproofing fibrous materials. No. 852,372. I. G. Farbenindustrie A. G.
Manufacture of low carbon nickel. No. 852,322. I. G. Farbenindustrie A. G.
Process of lining cast iron with non-ferrous metals. No. 852,245. Th. Goldschmidt A. G.
Manufacture of mineral wool by blowing fused mineral matter such as slag or analogous substance. No. 852,290. Deutsche Eisenserke A. G.
Process for preparing glazes and glass specified by means of gas. No. 852,381. Vereinigte Chemische Fabriken Kreidl, Heller & Co. Nfg.
Process for producing potassium nitrate from ammonium nitrate and potassium chloride or sylvinite. No. 852,210. Office National Industrielle de l'Azote.
Preparation of pure cryolite. No. 852,259. Silikon G.m.b.H. Ausarbeitung und Verwertung Industrieller Verfahren.
Manufacture of acetone and of butyl alcohol by fermentation. No. 852,298. C. Weizman.
Process of preparing sulfur. No. 852,369. I. G. Farbenindustrie A. G.
Obtainment of elementary sulfur from pyrites. No. 852,370. I. G. Farbenindustrie A. G.
Substituted perylene-tetracarboxylic acids, vat dyes derived therefrom, and preparation thereof. No. 852,254. I. G. Farbenindustrie A. G.
Liquid coating for skis. No. 852,318. K. Pohle.
Preparation of new products of the quinoxaline type and azo dyes derived therefrom. No. 852,353. Société pour l'Industrie Chimique à Bale.
New azo dyes derivatives. No. 852,410. Société pour l'Industrie Chimique à Bale.
Process of hydrogenating hydrocarbons under pressure. No. 852,269. I. G. Farbenindustrie A. G.
Process of cracking hydrocarbons. No. 852,271. I. G. Farbenindustrie A. G.
Manufacture of high quality lubricating oils. No. 852,371. I. G. Farbenindustrie A. G.
Hydrogenation of products from distillation or extraction of coal. No. 852,380. Gewerkschaft Mathias Stinnes.
Process for recovering residual palm oil from previously extracted palm oil substances. No. 852,387. Duchscher & Co.
Catalyst for the treatment of hydrocarbon oils. No. 852,416. Standard Oil Development Company.
Process for separating butadiene from gaseous hydrocarbon mixtures. No. 852,229. The Dow Chemical Company.
Water softening process and apparatus. No. 852,333. A. G. Freeborn.
Fractionating and extraction process for mixtures of organic isomers compounds. No. 852,377. N. V. de Bataafsche Petroleum Mij.
Process and apparatus for utilizing the activating properties of cajeputene mono-hydrate derivatives and application in the treatment of saline solutions. No. 852,182. Hydrotechnie Moderne S. A.
Refractory product from dolomite and chromite. No. 852,198. S. A. des Ets. A. Valuy.
Regeneration of synthetic gels used as catalysts. No. 852,415. Standard Oil Development Company.

Granted October 24, 1939; Published November 9, 1939.*

Aluminothermic welding. No. 50,262/800,129.* Aciéries de Gennevilliers.
Process for preparing waxy substances. No. 50,297/759,261.* I. G. Farbenindustrie A. G.
Preparation of tanning substances. No. 50,268/831,060.* I. G. Farbenindustrie A. G.
Preparation of synthetic tanning substances. No. 50,277/823,565.* I. G. Farbenindustrie A. G.

Granted October 30, 1939; Published November 16, 1939.

Improved process of treating cellulose textile fibres and cellulose textile materials and products obtained thereby. No. 852,461. Ridgway, Whiting & Bodenschatz, Inc.
Improvement in methods of preparing cellulose solutions. No. 852,487. Ridgway, Whiting & Bodenschatz, Inc.
Process of manufacturing films, filaments, etc. No. 852,613. E. I. du Pont de Nemours & Co., Inc.
Process for producing artificial viscose filaments. No. 852,637. Vereinigte Glanzstoff-Fabriken A. G.
Heat treatment of steel. No. 852,477. J. M. R. Goebel.
Improvements in fusing aluminum or aluminum alloys and other easily fusible metals and alloys. No. 852,500. The Austin Motor Co., Ltd.
Process for isolating the nickel and the copper present in nickel-copper matte. No. 852,556. I. G. Farbenindustrie A. G.
Dry glazing process. No. 852,428. Vereinigte Chemische Fabriken Kreidl. Heller & Co. Nfg.
Process of preparing glazes and glass opacified by means of gas. No. 852,429. Vereinigte Chemische Fabriken Kreidl, Heller & Co. Nfg.
Process of preparing glazes opacified by means of gas, and particularly glaze powder. No. 852,430. Vereingte Chemische Fabriken Kreidl, Heller & Co. Nfg.
Process and apparatus for the production of fibres of glass or analogous fusible materials. No. 852,503. S. A. des Manufactures des Glaces et Produits Chimiques de Saint-Gobain, Chauny et Cirey.
Process of manufacturing magnesium phenolates. No. 852,593. Bakelite G.m.b.H.
Process for the manufacture of azo dyes and their application in dyeing cellulose materials. No. 852,452. Imperial Chemical Industries, Limited.
Naphthol-sulfonic acids, azo dyes derived therefrom, and processes for preparing them. No. 852,475. I. G. Farbenindustrie A. G.
Process for producing secondary disazo mordant blue dyes. No. 852,484. Durand & Huguenin S. A.
Process for the manufacture of new azo dyes. No. 852,594. Imperial Chemical Industries, Limited.

* Certificates of addition to previously granted patents. Second number is that of the original.

Solvent treatment of mineral oils. No. 852,454. Standard Oil Development Co.
Process and apparatus for the conversion of hydrocarbons oils. No. 852,563. The M. W. Kellogg Co.
Preparation of sulfonated fatty bodies and application of such bodies in the treatment of fibrous matters. No. 852,588. National Oil Products Company.
Process for collecting oxidation products, particularly of fatty acids, alcohols or others, by oxidation of high molecular weight hydrocarbons. No. 852,597. Vereinigte Oelfabriken Hubbee & Farenholtz.
Improvements in protein-base products. No. 852,540. C. Weizmann.
Process for the purification of water. No. 852,631. I. G. Farbenindustrie A. G.
Improved stabilized polymer product. No. 852,453. Standard Oil Development Co.
Acetaldehyde-base plastic material. No. 852,511. Société Française Helita.
Water-soluble condensation products and process of preparation. No. 852,565. I. G. Farbenindustrie A. G.

Granted November 9, 1939; Published November 23, 1939.

Process for the treatment of starch. No. 852,827. Corn Products Refining Co.
Process for the manufacture of crystalline dextrose. No. 852,826. Corn Products Refining Co.
Artificial fibres and process of producing them. No. 852,905. I. G. Farbenindustrie A. G.
Process of manufacturing a product imitating astrakan and resulting product. No. 852,723. H. Kahane.
Production of wood pulp. No. 852,917. The Pangara Holding Corporation, Ltd.
Non-corrodable aluminum alloy. No. 852,702. M. L. Mothiron.
Process for reduction of ores, and particularly iron ores. No. 852,897. F. M. Wiberg.
Process and apparatus for heat treating steel rails. No. 852,749. C. P. Sandberg and O. F. A. Sandberg.
Improvements in the treatment of surfaces of aluminum and aluminum alloy articles. No. 852,754. The British Aluminum Co., Ltd.
Refractory product and process of manufacture. No. 852,899. Y. J. Seurat.
Humectants. No. 852,792. I. G. Farbenindustrie A. G.
Process of manufacturing calcium sulfide or barium sulfide and products obtained. No. 852,794. S. A. de Matériel de Construction.
Process of obtaining manganates. No. 852,807. "Azot" Spolska Akcyjna.
Process and apparatus for producing calcium sulfide and eventually calcium sulfate, and products obtained. No. 852,878. S. A. de Matériel de Construction.
Chromiferous complexes of azo dyes and process of producing same. No. 852,791. I. G. Farbenindustrie A. G.
Process for the preparation of a strongly dispersible pigment and product obtained therewith. No. 852,824. I. G. Farbenindustrie A. G.
Process of preparing vat dyes of the phthalocyanic series. No. 852,912. I. G. Farbenindustrie A. G.
Solvent treatment of mineral oils. No. 852,860. Standard Oil Development Co.
Artificial resinous compositions similar to rubber. No. 852,946. Cie. Française poul l'Exploitation des Procédés Thomson-Houston.
Process of manufacturing condensation resins from amines, and resin obtained. No. 852,962. Dr. Kurt Albert G.m.b.H. Chemische Fabriken.
Adhesive products, process of manufacture, and their applications. No. 852,825. Corn Products Refining Co.
Process of manufacturing plastic masses. No. 852,781. Felten Guilleame Carlswerke A. G.
Plastic product. No. 852,861. Standard Oil Development Co.
Condensation products and process of preparing them. No. 852,875. Deutsche Hydrierwerke A. G.

Because of an unavoidable delay the Belgian patents did not reach us in time for inclusion in this issue.